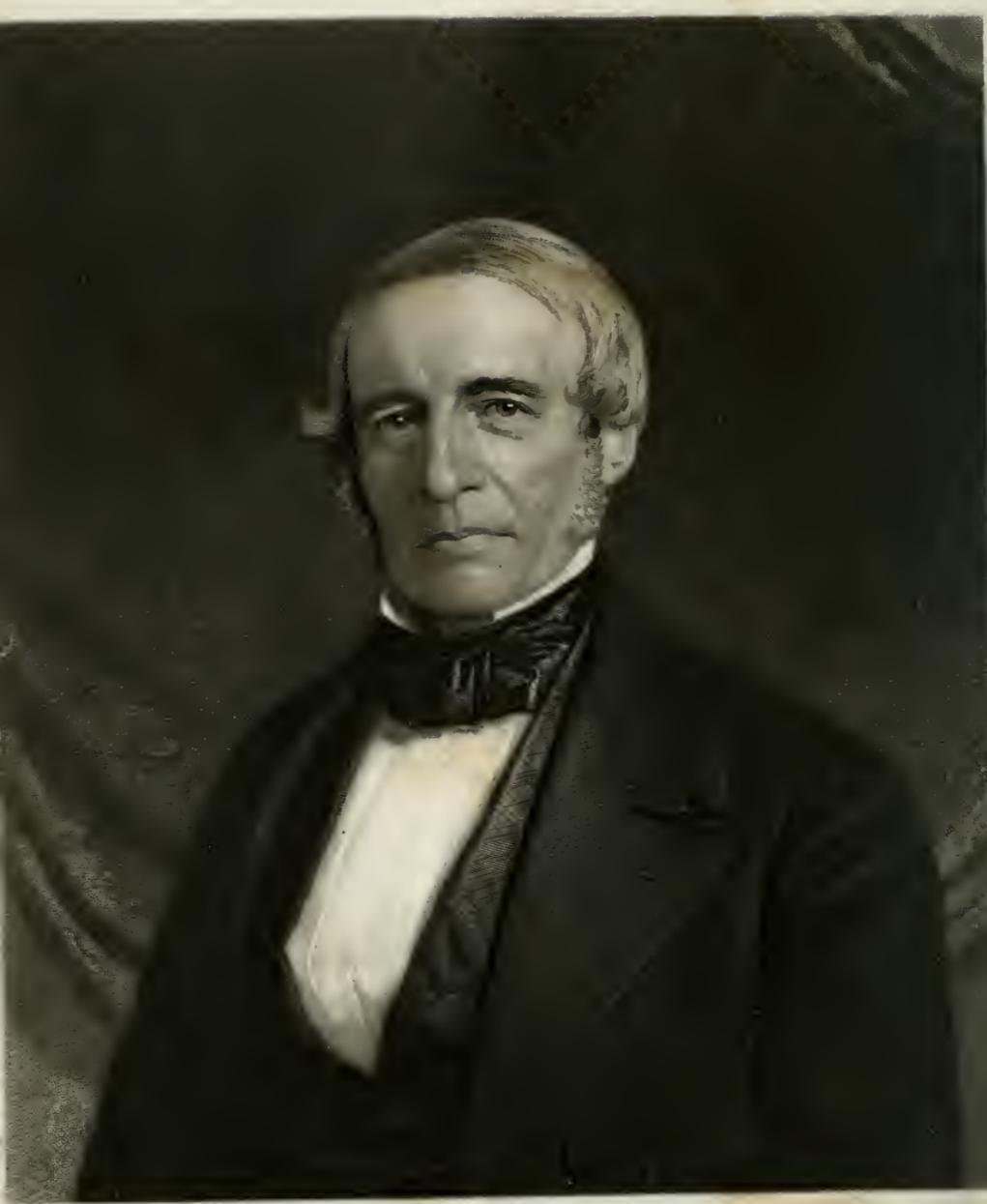


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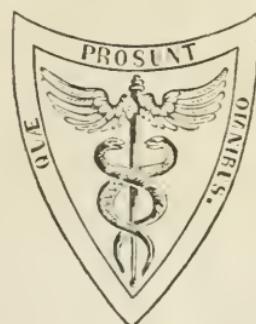
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I. MINIS HAYS, A.M., M.D.

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Contributors who wish their articles to appear in the next number are requested to forward them before the 1st of August.

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CONTENTS
OF
THE AMERICAN JOURNAL
OF
THE MEDICAL SCIENCES.
NO. CLV. NEW SERIES.

JULY, 1879.

ORIGINAL COMMUNICATIONS.

MEMOIRS AND CASES.

ART.	PAGE
I. Sarcoma of the Long Bones; Based upon a Study of One Hundred and Sixty-five Cases. By Samuel W. Gross, A.M., M.D., Mütter Lecturer on Surgical Pathology in the College of Physicians of Philadelphia, and Surgeon to the Jefferson Medical College Hospital, and to the Philadelphia Hospital.	17
II. The Sudden Deafness of Syphilis, with Cases. By Samuel Sexton, M.D., Surgeon to the New York Ear Dispensary, Aural Surgeon to the New York Eye and Ear Infirmary.	57
III. On So-called Hernia of the Trachea, with a Case of Incomplete Internal Fistula of the Trachea (or Larynx), accompanied by the Development of Air Sac. By Stuart Eldridge, M.D., late Lecturer on Anatomy in the Medical Department of Georgetown University; Surgeon of the General Hospital of Yokohama, Japan.	70
IV. A Case of Torsion of the Ileum. By James C. Wilson, M.D., Attending Physician to the Philadelphia Hospital and to the Hospital of the Jefferson Medical College, Philadelphia.	78
V. Deformity of Shoulder following Nerve Injury. By L. McLane Tiffany, M.D., Professor of Operative Surgery in the University of Maryland.	85
VI. On Abdominal Drainage of Adherent Portions of Ovarian Cysts as a substitute for Completed Ovariectomy. By Lewis A. Stimson, M.D., Surgeon to the Presbyterian Hospital, New York.	88
VII. The Topical Uses of Ergot. By William C. Dabney, M.D., of Charlottesville, Virginia.	101
VIII. Notes on Intra-ocular Lesions Produced by Sunstroke. By F. C. Hotz, M.D., Ophthalmic Surgeon to the Illinois Charitable Eye and Ear Infirmary, Chicago.	105
IX. The Value of Warm Water in Surgery. By A. H. Goelet, M.D., of New York.	113
X. A Colorimetric Method for the Quantitative Determination of the Biliary Acids and Colouring Matter. By J. O. Hirschfelder, M.D., Professor of Materia Medica in the Medical College of the Pacific, San Francisco.	120
XI. Palato-Pharyngeal Tumour. By Johnson Eliot, M.D., Professor of Clinical Surgery in the Medical Department of the University of Georgetown; one of the Attending Surgeons to Providence Hospital.	124

ART.

	PAGE
XII. Intra-orbital Sarcoma, forcing the Eye Downwards and Forwards; Removal, and Replacement of the eye. By John H. Packard, M.D., Surgeon to the Episcopal Hospital, Philadelphia.	126
XIII. Contributions to the Minute Anatomy of the Liver. By William G. Davis, M.D., of Philadelphia.	128
XIV. Sanitary Drainage. By M. Carey Lea, Esq., of Philadelphia.	135
XV. Gunshot Wound through both Hemispheres of the Brain; Retention of Bullet in the Cranial Cavity; Convulsions, Recovery, with persistence of all the Cerebral Functions. By P. F. Harvey, M.D., Captain and Assistant Surgeon, U.S.A.	146
XVI. Report of a Case of Malignant Tumour of the Abdomen, greatly resembling, and even mistaken for, one of Extra-uterine Pregnancy. By Walter F. Atlee, M.D., of Philadelphia.	153
XVII. An Old Neuralgia Cured by an Operation. By Jno. T. King, M.D., of Baltimore, Md.	156

REVIEWS.

XVIII. The Principles and Practice of Gynaecology. By Thomas Addis Emmet, M.D., Surgeon to the Woman's Hospital of the State of New York, etc. With one hundred illustrations, 8vo. pp. 855. Philadelphia: Henry C. Lea, 1879.	157
XIX. Iconographie Photographique de la Salpêtrière (service de M. Charcot). Par Bourneville et P. Regnard. Part 2me. 4to. pp. 234. Plates. No. xxxix. Paris: V. Adrien Delahaye & Co., 1878.	173
XX. Cerebral Localization. Lectures on Localization in Diseases of the Brain. By Prof. J. M. Charcot. Edited by Bourneville. Translated by Edward P. Fowler, M.D. 8vo. pp. 133. New York: William Wood & Co., 1878. The Localization of Cerebral Disease. By David Ferrier, M.D., F.R.S., etc. 8vo. pp. 142. New York: G. P. Putnam's Sons, 1879. Revue Générale des Sciences Médicales. Art. des Localisations Cérébrales Corticales. Par H. Rendu. pp. 298. 15 Janvier, 1879.	182

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XXII. The Croonian Lectures on Certain Points connected with Diabetes. Delivered at the Royal College of Physicians. By F. W. Pavy, M.D., F.R.S. 8vo. pp. viii., 126. London: J. & A. Churchill, 1878.	199
XXIII. Lectures on Dermatology; delivered in the Royal College of Surgeons of England in 1876-1877-1878. Including Derangements of the Colour of the Skin; together with Affections of the Nails, Hair System, and Cutaneous Gland System. By Erasmus Wilson, F.R.S., etc. 8vo. pp. 286. London: J. & A. Churchill, 1878.	204
XXIV. Papers on the Female Perineum, etc. By J. Matthews Duncan, A.M., M.D., LL.D., F.R.S.E., Obstetric Physician to St. Bartholomew's Hospital. Small 8vo. pp. 156. London: J. & A. Churchill, 1879. 206	

ART.

PAGE

XXV. Health, and How to Promote it. By Richard McSherry, M.D., Professor of Practice of Medicine, University of Maryland; President of Baltimore Academy of Medicine, etc. 24mo. pp. xi., 185. New York: D. Appleton & Co., 1879.	208
XXVI. On Deafness, Giddiness, and Noises in the Head. By Edward Woakes, M.D., Lond., Surgeon to the Ear Department of, and to, the Hospital for Diseases of the Throat and Chest. 8vo. pp. 143. London: H. K. Lewis, 1879.	210
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XXVIII. Transactions of the Obstetrical Society of London. Vol. XX. For the Year 1878. pp. 346. London: Longmanns, Green & Co., 1879. .	217
XXIX. Handbook of Diagnosis and Treatment of Diseases of the Throat and Nasal Cavities. By Carl Seiler, M.D., Lecturer on Laryngoscopy at the University of Pennsylvania; Chief of the Throat Dispensary at the University Hospital; Curator of the Pathological Society, etc. etc. 12mo. pp. 156. Philadelphia: Henry C. Lea, 1879.	219
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XXXI. Demonstrations of Anatomy: being a Guide to the Knowledge of the Human Body by Dissection. By George Viner Ellis, Emeritus Professor of Anatomy in University College, London. From the eighth and revised English edition. 8vo. pp. 716. Philadelphia: Henry C. Lea, 1879.	223
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ART.	PAGE
and revised English edition. 8vo. pp. xv., 554. Philadelphia: Henry C. Lea, 1879.	226
XXXV. Report of Investigations into the Pathogeny of Diphtheria. Conducted by Edward Curtis, M.D., and Thomas E. Satterthwaite, M.D. 8vo. pp. 56.	230
XXXVI. Notes on Rhenmatism. By Julius Pollock, M.D., F.R.C.P., Senior Physician and Lecturer on Medicine, Charing Cross Hospital, etc. 12mo. pp. 115. London: J. & A. Churchill, 1879.	232
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XXXIX. A Treatise on Therapeutics, comprising Materia Medica and Toxicology, with especial reference to the Application of the Physiological Action of Drugs to Clinical Medicine. By H. C. Wood, Jr., M.D., Professor of Materia Medica and Therapeutics in the University of Pennsylvania. Third edition, revised and enlarged. 8vo. pp. 720. Philadelphia: J. B. Lippincott & Co., 1879.	234
XL. A Guide to Therapeutics and Materia Medica. By Robert Farquharson, M.D., Edin., Lecturer on Materia Medica at St. Mary's Hospital Medical School. 2d American edition. Revised by the Author. Enlarged and adapted to the United States Pharmacopœia, by Frank Woodbury, M.D. 12mo., pp. 498. Philadelphia: Henry C. Lea, 1879.	235
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XLII. Atlas of Skin Diseases. By Louis A. Duhring, M.D., Professor of Skin Diseases in Hospital of University of Pennsylvania; Physician to Dispensary for Skin Diseases, Philadelphia; Dermatologist to Philadelphia Hospital, etc. Part V. Philadelphia: J. B. Lippincott & Co., 1879.	236
XLIII. Habitual Drunkenness, and Insane Drunkards. By John Charles Bucknill, M.D., Lond., F.R.S.; Late Lord Chancellor's Visitor of Lunatics. 16mo. pp. xxx., 103. London: Macmillan & Co., 1878.	237
XLIV. A Guide to the Qualitative and Quantitative Analysis of the Urine; designed for Physicians, Chemists, and Pharmacists. By Dr. C. Neubauer and J. Vogel, with a preface by Prof. D. R. Fresenius. Translated from the seventh enlarged and revised German edition by Elbridge G. Cutler, M.D., Pathologist at the Boston City Hospital, etc. Revised by Edward S. Wood, M.D., Prof. of Chemistry in the Medical School of Harvard University. 8vo. pp. xxiv., 551. New York: Wm. Wood & Co., 1879.	238

QUARTERLY SUMMARY

OF THE

IMPROVEMENTS AND DISCOVERIES IN THE MEDICAL SCIENCES.

ANATOMY AND PHYSIOLOGY.

PAGE	PAGE		
Case of Total Absence of the Spleen. By Koch and Wachsmuth.	239	Physiological Albuminuria. By Dr. Marcacci.	240
Case of Obliteration of Vena Cava Inferior, with great Stenosis of Orifices of Hepatic Veins. By Dr. William Osler.	239	Estimation of Sugar in the Urine. By Hagen and Müller.	241

MATERIA MEDICA AND THERAPEUTICS.

The Therapeutic Value of Croton Chloral. By Dr. Riddell.	242	Ramsay, and John G. McKendrik.	244
Defibrinated Blood for Rectal Alimentation. By Dr. Andrew H. Smith.	242	Benzoate of Sodium as an Antipyretic and Antiseptic. By Graham Brown.	245
On the Use of Ether with Cod-liver Oil. By Dr. Andrew H. Smith.	243	The Haematinic Properties of Dialyzed Iron. By Dr. Robert Amory.	246
Diuretic Action of Squill. By M. Drouot.	243	Physiological Action of Sclerotic Acid. By Nikitin.	246
Effects of Chloroform, Ethidene, and Ether on Blood Pressure. By Drs. Joseph Coats, William		Physiological Action of Nicotine. By René.	247

MEDICINE.

Observations on the Subject of Croup and Diphtheria. By Dr. W. H. Dickinson.	248	plicated with Gangrene. By M. Peyrot.	255
Chloral Hydrate in Diphtheria. By Professor von Rokitansky.	251	Mucous Concretions in the Intestine. By M. Henri Huchard.	255
Chorditis Vocalis Inferior Hypertrophic. By Professor Schroetter.	251	A Rare Case of Chronic Coprostasis. By Dr. Fleck.	256
Laryngeal Crisis. By M. Charcot.	252	Hedysarum Gangeticum in Dysentery. By Amrito Lal Deb.	256
Laryngeal Phthisis. By Dr. F. H. Bosworth.	252	On Chronic Bright's Disease, and its Essential Symptoms. By Dr. F. A. Mahomed.	257
Use of the Carbolic Spray in Catarhal Affections. By Moritz.	252	Case of Paralysis of the Ulnar Nerve. By Sabourin.	257
Case of Calcification of the Lungs.	253	Case of Rare Vaso-Motor Disturbance in Leg. By Dr. Allen Sturge.	258
Aortitis accompanied by Neuritis of the Cardiac Plexus. By Cuffer.	254		
Prognosis in Cases of Diabetes com-			

SURGERY.

Report on Pyaemia.	260	The Influence of Antiseptic Treatment on Injuries of the Head. By Prof. Estlander.	262
Typhoid Fever and Periostitis. By M. Mercier.	261		

PAGE	PAGE		
Salivary Tumour, following Extirpation of a Tumour of the Parotid Gland. By M. Martinet.	262	successfully treated by Catgut Suture. By Dr. Riedinger.	267
Removal of a Biliary Calculus from the Gall-bladder. By Mr. Thomas Bryant.	263	The Cure of Hemorrhoids by the Hypodermic Injection of Carbolic Acid. By Mr. Edmund Andrews.	268
Renal Cyst mistaken for Ovarian; Extirpation of the Kidney; Recovery.	263	Symptoms and Treatment of Cystitis of the Neck of the Bladder. By Laforest.	268
A Rare Form of Intestinal Obstruction due to Invagination of a Portion of the Small Intestine in the Walls of the Rectum; Gastrotomy; Recovery. By Mr. Edward Bellamy.	264	Deligation for Aortic Aneurism of the Right Carotid and Subclavian Arteries, with a new species of Ligature. By Mr. Richard Barwell.	269
Laparotomy with Antiseptic Treatment. By Professor Czerny.	265	Electrolytic Treatment of Aneurisms of the Aorta. By Dr. Bucquoy.	272
Acute Intestinal Obstruction: Laparotomy; Removal of large Impacted Gall-Stone from Ileum; Death from Peritonitis. By Mr. Thomas Bryant.	267	Resection of the Elbow for Ankylosis. By M. Ollier.	273
Double Perforation of Intestine suc-		Amputation at the Hip-joint; Iliac Arteries Compressed by Lever. By Mr. A. Pearce Gould.	273
		Sutural Junction of a Divided Ulnar Nerve. By Mr. Hulke.	276

OPHTHALMOLOGY AND OTOTOLOGY.

Tobacco Blindness. By Dr. Martin.	277	Singing in the Ears treated by Nitrite of Amyl. By Michael.	277
---	-----	---	-----

MIDWIFERY AND GYNÆCOLOGY.

The Use of Forceps and its Alternatives in Lingering Labours. By Dr. Robert Barnes.	278	ine Life, and which is generally described under the name "Rickets." By M. Depaul.	279
Puerperal Fever treated by Benzoate of Soda. By Dr. Peterson.	279	The Diagnostic Puncture of Abdominal Cysts with Serous Contents of Low Density. By Prof. Spiegelberg.	280
A Giant Birth—One Child weighing twenty-three and three-quarter pounds. By Dr. A. P. Beach.	279	Double Oophorectomy. By Dr. Alexander R. Simpson.	280
Special Malady of the Osseous System developed during Intra-uter-			

MEDICAL JURISPRUDENCE AND TOXICOLOGY.

Sulphate of Soda as an Antidote	against Poisoning with Carbolic Acid. By Dr. Sonneberg.	280
---------------------------------	-----------	---	-----

OBITUARY NOTICE.

ISAAC HAYS, M.D.	281
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THE
AMERICAN JOURNAL
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FOR JULY 1879.

ARTICLE I.

SARCOMA OF THE LONG BONES; BASED UPON A STUDY OF ONE HUNDRED AND SIXTY-FIVE CASES. By SAMUEL W. GROSS, A.M., M.D., Mütter Lecturer on Surgical Pathology in the College of Physicians of Philadelphia, and Surgeon to the Jefferson Medical College Hospital, and to the Philadelphia Hospital.

In the last edition of his work on "Surgical Pathology," Professor Billroth states that "the subdivisions, made according to the histological peculiarities of the various sarcomata, are of no great value during life;" but being convinced, from personal observation, that clinical differences exist among the divisions of sarcoma as marked as are met with among the varieties of carcinoma, I have ventured to differ from so distinguished an investigator, and have studied these growths, as all morbid processes should be studied, with the view of determining the relations subsisting between their minute structure and their clinical characters. To attain this end I have carefully analyzed one hundred and sixty-five cases, many of which are original, and the number might have been very materially increased had I included examples of mixed sarcomas. I have limited my investigations, however, to those cases alone in which the histological features of each form of sarcoma were typical, and I have used none, except a few of osteoid sarcoma, about the true nature of which there could be no doubt, that were not confirmed by microscopical examination.

The primary neoplasms of the long bones, exclusive of the clavicle, the metatarsal and metacarpal bones, and the phalanges, which I shall not consider, are, in the order of the frequency of their occurrence, sarcomas, osteomas, chondromas, osteoid chondromas, fibromas, and myxomas. Vascular and cystic growths, as I shall have occasion to show hereafter,

are, for the most part, nothing more than metamorphosed sarcomas, while it is extremely doubtful whether primary carcinoma ever occurs in the osseous system. Since sarcomas affect the long bones more frequently than all the other tumours combined, and as they constitute an important group of morbid growths which are not thoroughly understood, and are described under a great number of different and confusing names, I shall devote this and a succeeding paper to a description of their histology, general pathology, symptomatology, diagnosis, prognosis, and treatment, covering, as far as possible, the entire field, although in doing so I will touch upon some points which may be considered elementary, but which I trust may prove to be instructive to those not entirely familiar with the subject.

The term sarcoma, which is of very ancient date, and was employed by Abernethy to designate tumours "having a firm and fleshy feel," was revived by Virchow, and is now employed by him and other pathologists and most surgeons to indicate a new formation of the connective tissue series, which is composed almost entirely of unripe, transitional, or embryonic cells, which serve to distinguish it, on the one hand, from the perfected tumours of that system, and, on the other, from the carcinomas. From the excessive preponderance, development, and mode of arrangement of its cellular constituents, which endow it with its peculiar characters, and from their indisposition to pass into higher tissues, they constitute a structure which is unlike any natural structure, and may, therefore, be regarded as an atypical production. The cells are contained in an intercellular substance, which is hyaline, granular, fibrillated, or alveolar, which, along with the various degenerations to which these tumours are liable, give rise to certain subdivisions. The principal varieties of sarcoma of the bones, which are determined by the prevailing form and size of their cellular elements, are the round-celled, the spindle-celled, and the giant-celled, the cells themselves merely representing different stages of development. In accordance with the dimensions of the cells, they are, moreover, separated into the small-celled, and large-celled, a distinction which is most useful, not only because the size of the cells influences the consistence of the tumours, but from the fact that it has a special bearing upon the prognosis.

Certain subdivisions of sarcoma are constituted by the nature of their matrix or intercellular substance, by their transformations, and by their vascularity. Thus, when fibrous tissue replaces in great part the ordinary intercellular substance, the growth is called a fibrous sarcoma. When the basis substance has undergone mucoid transformation, it is a myxomatous sarcoma; when it presents the appearance of the reticulum of the lymph glands, it is known as lymphadenoid sarcoma; when it forms an alveolar structure, it is an alveolar sarcoma; when the cells have undergone fatty degeneration and granules of fat and free oil are disseminated in the inter-

cellular substance, it is a lipomatous sarcoma; the presence of certain other constituents, as the mineral salts, bone, or cartilage, produces respectively calcifying, ossifying, and chondroid sarcomas; when they have undergone cystic degeneration, they are known as cystic sarcomas; excessive vascularity gives rise to telangiectatic sarcoma; and effusions of blood, to hemorrhagic sarcoma. All these subdivisions, pure or variously intermixed, are met with in the sarcomas of the long bones, the only one that is missing being pigmented or melanotic sarcoma, of which I have been unable to find a single recorded example.

Sarcoma of the bones is generally denominated osteosarcoma, but the latter term, which is employed by clinicians, should be dropped, since, from a histological standpoint, it signifies a sarcoma, whether it be seated in or on a bone, or in the soft parts, containing osseous tissue of new formations, and is synonymous with osteoid or ossifying sarcoma. As an evidence of the confusion that has arisen from retaining that name, I may mention that Wilks and other English writers call the periosteal osteoid sarcomas osteosarcomas, while many German pathologists employ the term to designate myeloid tumours, which are always central.

According to their point of departure they may be separated into the peripheral, periosteal, or periosseous, and the central, endosteal, intraosseous, or myelogenic, a division which is not only convenient as designating their seat, but which is also justified by the fact, that, in general, they present marked differences in their histological construction, and are of different prognostic import. Thus, the majority of the peripheral growths, which proceed from the layer of embryonic cells, or osteoblasts, which separates the periosteum from the bone, and is variously known as the osteogenic substance of Ollier, the ossification blastema of Kölliker, the proliferating layer of the periosteum of Virchow, and the cambium layer of the bone of Max Schultze, are osteoid spindle-celled growths, while the central tumours, which develop from the medulla, and from the osteoblastic layer which lines the interior of the medullary canal, are, as a rule, giant-celled sarcomas.

In their macroscopic or gross appearances these two divisions of sarcoma present some points of difference which may be utilized for diagnostic and prognostic purposes, in the absence of microscopical examination. The central tumours, particularly those of the giant-celled variety, are inclosed in a capsule or case, which may be entirely bony, but which is usually partly bony and partly membranous. The periosteal formations, on the other hand, are limited by the outer fibrous layer of that membrane, or, in the event of its participation in the proliferation, by a capsule of connective tissue. In either event, osseous tissue is never found in the investing membrane, so that the presence or absence of bone in the capsule is of great value in the determination of the original seat of the new growth.

Although the sarcomas are very liable to certain transformations which tend to obscure their diagnosis from their naked-eye appearances, yet, in their pure forms, their structure is so dissimilar, that we may judge pretty accurately of their nature by their tints and consistence. Thus a tumour which presents a dark red or maroon colour can be nothing else than a giant-celled sarcoma. Specimens which are characterized by a firm, glistening, grayish-white tissue come under the subdivision of large spindle-celled sarcoma. When there is an admixture of bony spicules and soft tissue, there need be no doubt as to its osteoid nature; should the soft portion be dense and firm, it may be termed an osteoid fibrous sarcoma; if it be soft and medullary, it will probably turn out to be an osteoid round-celled tumour; while, if it be semifluid and gelatinous, it forms a myxomatous osteoid sarcoma. Tumours which have the consistence and appearances of the brain of a newly-born child may be ranked among the medullary or encephaloid sarcomas of the small round-celled type, although the soft, small spindle-celled tumours present precisely similar features. When the tissue looks like a recent coagulum, or contains one or more cysts filled with blood, we will be right in assuming that we are dealing with a highly vascular medullary growth. These conclusions are based upon the combined clinical and microscopical characters of sarcomas, and may be held to be as true for this group of neoplasms as it is true that the gross characters of scirrhous carcinoma, for example, correspond to a known type of structure.

In their configuration, sarcomas of the long bones vary in accordance with their situation. Central tumours, whether they occupy the epiphyses or diaphyses, are generally spherical. Periosteal tumours are long, oval, or fusiform, when they occupy the shafts; while they are pyriform, with their base towards the articulation, when they surround the articular ends of the long bones; or conoidal, when they develop from a limited portion of the joint-end. Their surface is usually smooth and even, although it may be tuberous, bossed, or lowly-lobed, which is particularly liable to be the case when their investing capsules are implicated in the new formation, and when they have softened, and are about to become the seat of ulceration. Their volume varies very greatly. They may be no larger than a walnut, or they may attain huge dimensions, as, for example, three feet in circumference. In the latter event, it may be assumed that the growth is the seat of interstitial hemorrhage or cystic transformation.

So long as they are circumscribed by their investing capsules, sarcomas merely stretch and push aside the surrounding tissues; but when their capsules take part in the cell proliferation, or are perforated, they evince a locally infectious nature, and become diffused, either through the conversion of the cells of the tissues into like elements, or through the continuous multiplication of the tumour elements. In the peripheral sarcomas, the bone generally passes through the growth unchanged. In some in-

stances the cortex of the compact substance is the seat of condensing sclerosis; in others, it is eroded, pitted, or, as it were, worm-eaten. In others, infection of the compact tissue ensues without changes in its outer surface, through which nodules are formed in it, and give rise to what may be termed interstitial sarcoma, although I have never known a tumour to originate primarily in this situation. Again, the disease may extend along the Haversian system to infect the medulla. Finally, the tumour may occupy all these localities, so that we may even find a sarcoma which has originated in the periosteum constituted as follows: masses in the medulla, interstitial deposits in the compact tissue, a large tumour around the shaft, and, finally, one growing from the fibrous layer of the periosteum, the last two of which are merely separated and cut up into lobules by the remains of that membrane. In the central sarcomas, the original bone is usually destroyed to such an extent that not a vestige of it remains.

Next to the carcinomata of the soft parts, the sarcomata of the bones are the most malignant of all neoplasms, as is evinced by the local infection of the adjacent tissues, the occasional implication of the associated lymphatic glands, and the occurrence of secondary deposits in the viscera and tissues belonging to the same series. From their tendency to infiltrate the surrounding structures, they show a great disposition to recur locally after extirpation, so that in the performance of an operation for their removal, the rule should be to amputate as far as possible from the seat of the disease. Unlike the carcinomata, the lymphatic glands are rarely the seat of primary contamination. Thus, of one hundred and thirty-three cases in which this point is noted, these organs were enlarged in only twenty-three. In thirteen of these the lymphatic tumour was merely due to irritation, as was shown by the fact, that in some cases it disappeared after the removal of the primary neoplasm, while, in others, minute examination failed to detect carcinomatous elements. In five fatal cases, the condition of the glands was not noted; while, in only five, were they converted into a tissue similar to the parent growth. These facts are of extreme interest, as they denote, in the first place, that enlargement of the lymphatic glands should not be regarded as a bar to operative interference, and, secondly, that systemic infection generally takes place through the blood and not through the lymph channels.

The general dissemination of sarcoma, or the occurrence of secondary growths in the viscera and in other tissues, is one of the most marked attributes of this class of morbid growths. Thus I find that 46.06 per cent. of all cases are characterized by this clinical feature, the metastatic tumours being found most commonly in the lungs, lymphatic glands, and other parts of the osseous system. In this connection it should be remembered that the secondary deposits are histologically identical with the primary growth. Through ignorance of this fact, it is not uncommon to

find writers describing a case, for example, as one of sarcoma of the femur with secondary cancerous deposits in the lungs, whereas, in truth, the latter do not deviate in their structure from the original tumour. A sarcoma always reproduces its like, a carcinoma its like, a chondroma its like, so that the anatomical peculiarities of a metastatic deposit enables us to decide as to the nature of the original tumour in the event of the latter having been removed by some other surgeon. A naked eye point of distinction between the secondary carcinomatous and sarcomatous growths, as of the liver, is the presence of umbilication in the former, and its absence in the latter.

While it is true that the sarcomas of the bones are to be regarded as malignant affections, yet the signs of malignity—that is to say, infection of the neighbouring tissues and local recurrence, extension to the lymphatic glands, and multiplication in distant parts—are not witnessed in the same degree in the different varieties of sarcoma, as is shown by the following table:—

VARIETY.	Adjacent Tissues. ¹ Per cent.	Local Recurrence. Per cent.	Extension to Glands. ² Per cent.	Generalization. Per cent.
Periosteal spindle-celled .	44	60	0	100
“ round-celled .	50	50	7.69	66.66
“ osteoid . .	40	41	6.25	65.62
Central round-celled .	66	25	8.33	33.33
“ spindle-celled .	18	20	0	23.07
“ giant-celled .	12	8	0	22.72

From an examination of the cases of destructive sarcomas, they may be classed, in the order of their malignity, as follows: Periosteal spindle-celled, periosteal round-celled, periosteal osteoid, central round-celled, central spindle-celled, and central giant-celled; the periosteal forms being more malignant by 43.5 per cent., as will be pointed out hereafter. Hence the comparative benignity of the central tumours may, to a certain extent, be ascribed to the slight disposition which they evince to extend beyond their bony or osteo-membranous capsules. With regard to the sarcomas composed of spindle cells—and they are synonymous with the recurrent tumours of Paget—it will be observed that they are endowed with the power of general dissemination to an extraordinary degree, so that the term recurrent, as designating the characteristic peculiarity in their history, is in nowise applicable to them.

Sarcomas of the long bones evince a great predilection for their articular extremities, and the majority develop in the spongy substance of the epiphyses. Whether of central or peripheral origin, they are liable, even

¹ Infection of surrounding tissues as shown on dissection of the limb after its removal.

² Instances of enlargement of the glands from irritation are excluded. Compare with page 21.

in the hands of the most skilful observers, to be confounded with other affections, such as aneurism, white swelling, strumous abscess, periosteal abscess, osteomyelitis, and gummata. Of these, aneurism of the bones and strumous articular osteitis have given rise to the greatest number of mistakes. They may be discriminated from abscesses by the exploring needle, and from syphilitic formations by the history of the case. Osteomyelitis, in addition to the tumefaction, gives rise to puffiness of the superincumbent soft structures, and is attended with irritative fever, and, now and then, with deep-seated throbbing pain.

From aneurism of the long bones, if there is really such an affection, and its occurrence is denied by Virchow,¹ Landi,² and Broca,³ the distinction is by no means always easy, particularly when, in addition to the pulsation, there is a bruit, as happened in four instances to which I shall call attention hereafter. In the majority of pulsating sarcomas there is no murmur, or, if it be present, it is not very distinct. Then, too, in sarcoma, pulsation is not found from the very commencement, nor is it expansile, and in some cases it is not remarked until the tumour begins to grow rapidly. Aneurisms, as is well known, are extremely rare before the thirtieth year, while two-thirds of the pulsating sarcomas occur before that age. Finally, when a pulsating growth is situated away from the line of a large vessel, as, for example, in the upper epiphysis of the fibula,⁴ it is far more likely to be a sarcoma than an aneurism.

White swelling is very liable to occasion mistakes in the diagnosis, and this is particularly true of those cases in which the adjacent joint has undergone destructive changes from nutritive disturbances, or has been invaded by the growing tumour, when the symptoms are so similar that a differential diagnosis, without exploratory incision, is scarcely possible.

White swelling, as of the knee, for example, usually occurs in serofulous subjects before the fifteenth year. There is pain from the very outset, which gradually increases in severity, and finally becomes so intense as to deprive the patient of sleep and seriously undermine his general health. The skin is tense and glossy; the superficial veins are abnormally large; the temperature is elevated; the joint is stiff, if not immovable, and efforts at motion produce great suffering; the articulation, moreover, is distorted and flexed; and puncture gives vent to pus or turbid synovial fluid containing flakes of lymph. White swellings do not pulsate, nor does manipulation elicit parchment-like crepitation.

In sarcomas, the absence of suppuration, or the slight tendency to the formation of pus, is a sign of great value. Other important distinguishing features of sarcoma are the preservation of the movements of the joint,

¹ *Pathologie des Tumeurs*, vol. iv. p. 68.

² *Amer. Journ. Med. Sciences*, January, 1878, p. 278.

³ *Traité des Tumeurs*, vol. ii. p. 212.

⁴ Langenbeck. *Langenbeck's Archiv*, vol. xxi., supplement, p. 333.

although in some cases the mobility is limited, freedom from suffering on motion, and absence of vicious position. In many cases, indeed, the patients are able to walk about without suffering or experiencing particular fatigue. In sarcoma, too, spontaneous fracture is not uncommon. Resistance to ordinary treatment, moreover, distinguishes sarcoma from white swelling. In the latter affection, rest and extension, along with gentle and equable compression of the joint, are of great benefit in relieving the pain and in restoring the impaired general health ; but in sarcoma, the tumour continues to grow despite the employment of these measures, and the local suffering is greatly increased by compression. These features, which have been carefully studied by Gilette¹ and Poinsot,² when considered in connection with the symptoms previously referred to, will generally suffice to differentiate the epiphyseal sarcomas from strumous articular osteitis.

Sarcomas of the long bones are most frequent in those of the lower extremity ; the femur, tibia, and fibula being affected in 76 per cent. of all cases. Thus—

Out of 165 cases which I have analyzed,

The femur was the seat of the disease in 67 instances.

The tibia	"	"	"	"	46	"
The humerus	"	"	"	"	25	"
The fibula	"	"	"	"	13	"
The ulna	"	"	"	"	7	"
The radius	"	"	"	"	6	"

The ulna and radius were the seat of the disease in 1 instance.

Separating these in accordance with their histological construction :—

70	were examples of giant-celled sarcoma.
45	" periosteal osteoid sarcoma.
16	" central spindle-celled sarcoma.
13	" periosteal round-celled sarcoma.
12	" central round-celled sarcoma.
9	" periosteal spindle-celled sarcoma.

Hence it follows that the giant-celled tumours are the most common, forming, as they do, 42 per cent. of the entire number. It will also be seen that the central tumours are more frequent by 18 per cent. than those which arise in the periosteum.

Males are more liable to their occurrence by 17 per cent. than females, as is shown in the following table of 149 cases in which the sex is given :—

¹ Bull. et Mém. de La Soc. de Chir. de Paris, vol. ii. 1876, p. 115.

² Ibid. vol. iii. 1877, p. 208.

Nature of Tumour.		Males.	Females.
Central giant-celled		33	30
" round-celled		7	5
" spindle-celled		11	5
Periosteal round-celled		10	3
" spindle-celled		4	5
" osteoid		22	14
		—	—
		87	62

The age at which they first manifest themselves averages 27 years. In the following table of 147 cases in which the age is denoted, I have separated their occurrence at the different epochs of life, from which it will be seen that 68 per cent. develop before the 30th year, and 32 per cent. after that period :—

Between 10 and 20 years of age	45 cases.
" 20 " 30 " "	55 "
" 30 " 40 " "	26 "
" 40 " 50 " "	11 "
" 50 " 60 " "	7 "
" 60 " 70 " "	3 "

Sarcomas of the long bones appear to be influenced in their histological construction by the age at which they appear. With the exception of the central spindle-celled, which are most common after the thirtieth year—the average being the thirty-sixth year—they all develop before that age, the mean being twenty-two for the periosteal osteoid, twenty-three for the periosteal round-celled, twenty-four for the periosteal spindle-celled, twenty-eight for the central round-celled, and a fraction above twenty-eight for the giant-celled.

Traumatism was the assignable cause in nearly one-half of the 144 cases in which the etiology is recorded. They could be traced to blows, falls, kicks, sprains, fractures, and other injuries in

31 out of 60 cases of giant-celled sarcoma.
2 " 12 " central round-celled sarcoma.
4 " 16 " spindle-celled sarcoma.
7 " 13 " periosteal round-celled sarcoma.
16 " 34 " osteoid sarcoma.
3 " 9 " spindle-celled sarcoma.

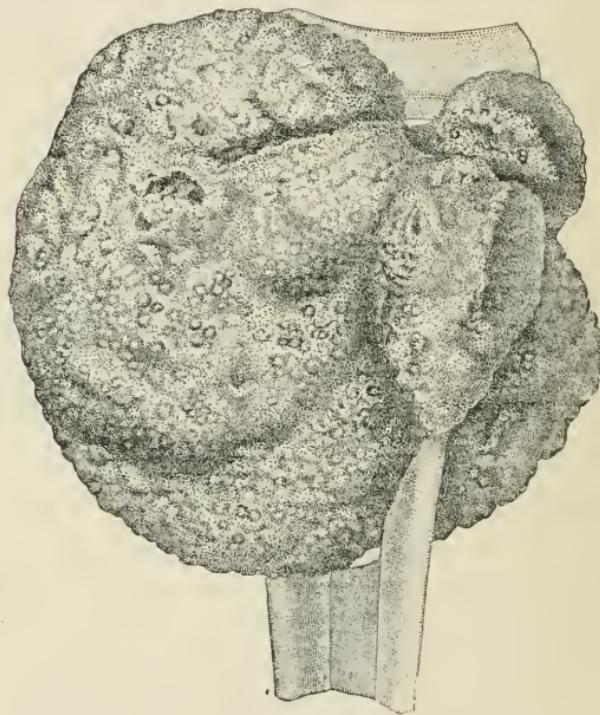
Having thus directed attention to what I consider to be some of the more important points in the general pathology and diagnosis of these new formations, I will now take up the study of the individual sarcomas, in which these data will receive more extended consideration.

1. GIANT-CELLED SARCOMA.

Of the central, intraosseous, endosteal, or myelogenous sarcomas of the long bones, by far the most interesting, from their relative frequency,

comparative benignity, and the large size of the cells of which they are mainly composed, are those denominated myeloid tumour by Paget,¹ myeloplastic tumour by Eugène Nélaton,² and giant-celled sarcoma by Virchow.³ Before the essential elements of these growths were first accurately described by Robin,⁴ although they had previously been recognized by Müller⁵ and Lebert,⁶ giant-celled sarcoma was, in accordance with its external characters or clinical peculiarities, generally ranked under the names of spina ventosa, spleen-like tumour, cancer of bones, fungus hematodes, erectile or aneurismal tumour of bones, spongy tumour, hematoid tumour, encephaloid tumour, and osseous cysts; and even at the

Fig. 1.



present day it is not uncommon for German writers to describe it merely as osteosarcoma. To avoid confusion, I shall refer to it as giant-celled or myeloid sarcoma, as these terms are in common usage.

Of the seventy examples of giant-celled sarcoma, which I have col-

¹ Lectures on Surgical Pathology, 1853.

² D'une Nouvelle Espèce de Tumeurs Bénignes des Os, ou Tumeurs à Myéloplaxes. Paris, 1860.

³ Die Krankhaften Geschwülste, vol. ii. p. 213.

⁴ Comptes Rendus de la Soc. de Biologie, 1849, p. 119.

⁵ Ueber den feinen Bau und die Formen der Krankhaften Geschwülste, Berlin, 1838, p. 6.

⁶ Physiologie Pathologique, T. ii. p. 120, 1845.

lected and analyzed for the purpose of elucidating the structure and general history of this variety of morbid growths, the most remarkable, from its volume, chronicity, and the advanced age at which it occurred, is that illustrated by fig. 1, reduced nearly three-fourths from a specimen which was removed after death, and presented to the Museum of the College of Physicians by Dr. R. E. Brown, of Mount Holly, New Jersey. Its history is as follows:—

I. M. S., 67 years of age, of full, plethoric habit, came under the care of Dr. Brown in December, 1871, on account of loss of muscular power, principally of the right side, which was shortly followed by general erysipelas, from which he succumbed in six weeks from commencement of his illness. During the past twenty-five years of his life Mr. S. had repeated attacks of erysipelas, and chronic ulcers were seated on both legs. Ten years previous to his death, whilst stepping off a street car, he slipped and twisted the left knee, the accident being attended with pain, and succeeded, a few days subsequently, by inflammation, as denoted by slight redness, swelling, and stiffness. At the expiration of six weeks, a soft tumour, as large as a hen's egg, was detected over the anterior and inner aspect of the joint: the discoloration of the integument gradually disappeared, but the pain persisted, although it was never so severe as to demand the use of large doses of opium. The new growth increased very gradually and measured thirty-two inches in its greatest circumference, at the time of the patient's decease. Its surface was hard, inelastic, and nodulated; the skin was somewhat tense, but of a natural hue; the subcutaneous veins were not dilated, nor could any enlargement of the popliteal, femoral, or inguinal glands be detected. The knee was semiflexed, but admitted of limited movement.

The head and upper portion of the shaft of the tibia, which include about two-fifths of the entire bone, form an irregular spherical osseous case, perfect at all points, and covered by the periosteum. The half of the mass from which this description is taken, is divided into three noduled, convex lobes, of which the anterior and largest is limited behind by the insertion of the sartorius muscle, the middle is included between that structure and a deep furrow which corresponds to the inner border of the gastrocnemius, while the posterior lobe is covered by the belly of the latter muscle. The middle lobe terminates above in a prominent spine, into which the semimembranosus muscle is inserted. All of the muscles and tendons that are in relation with the bony capsule are greatly thinned and fatty, while the ligament of the patella is much elongated and expanded into a thin membranous sheet which is merged into the periosteum. The osseous shell varies from $\frac{1}{16}''$ to $\frac{1}{2}''$ in diameter, the average being $\frac{1}{2}''$, and in the thickest portions are cavities filled with the tissue presently to be described. The great size of the mass may be inferred when it is stated that it is 9" in diameter, and that the distance between the tendon of the sartorius and the middle line is 7", so that the neoplasm grew principally at the expense of the anterior and lateral portions of the head of the tibia. The anterior segment of the articular surface of the tibia forms a deep, hemispherical, or cotyloid depression for the reception of the condyles of the femur, and its investing cartilage is everywhere perfect, although excessively thin. The joint itself is free from disease, but its motions are limited by the greatly

enlarged spinous process. The femur and the remainder of the shaft of the tibia are infiltrated with fat. In its fresh state, the soft portion of the tumour was composed partly of a moderately firm, dark-red tissue, which bore a striking resemblance to coarse muscular fibre which had been exposed to the air, and partly of a dark-red grumous or pulpy substance. Scattered throughout it were numerous cysts or cavities, both single and multilocular, which varied in size from a small hazel-nut to a Sicily orange, were circumscribed by fibrous tissue, and filled, for the most part, with fluid, semifluid, and clotted blood, only a few containing a straw-coloured liquid.

In addition to the large mass, the cancellous tissue of the anterior segment of the shaft of the tibia was occupied by a circumscribed tumour, as large as a pullet's egg, and separated from the original growth and from the medulla of the shaft by a distinct partition. In its recent state, it was of pretty firm consistence, and of a pinkish tint, mottled with spots of crimson and straw color, the pinkish hue being still apparent in the wet section. Anteriorly, the partition is composed of bone, but it is fibrous where it crosses the medullary canal, and is continuous posteriorly with the incurvated shaft of the tibia, which appears as if it had been weighed down by the superincumbent mass. There was no enlargement of the popliteal or femoral glands.

In its gross appearances the tumour, therefore, corresponds with the myelocystic tumour of Mr. Henry Gray,¹ and with the fibroid variety of encysted intraosseous myeloplaxic tumour of Nélaton.²

Minute examination of the principal mass failed to disclose the characteristic structure of myeloid sarcoma. Blood corpuscles were found in large numbers, and fibrous and large spindle-celled tissue, along with round and ovoid cells, all in an advanced stage of fatty degeneration, were abundant. In order, if possible, to obtain better sections, I removed, with the saw and knife, a portion of the posterior segment of the tumour, but there was little variation in the constituent elements. The spindle-celled tissue, in the form of interlacing bundles of closely aggregated fusiform cells, was most marked, but giant elements were very decidedly in the minority.

Entirely different from the histological construction of the old tumour was that of the small growth in the shaft of the tibia. This was seen to be a perfect specimen of giant-celled sarcoma, the multinucleated cells constituting the greater portion of the entire structure, and being distributed among a spindle-celled tissue as delineated in Fig. 2, for which I am indebted to my friend Dr. Shakespeare. They were mostly ovoidal and flask-shaped, and contained from three to forty or fifty ovoidal nuclei. In many cells the nuclei were wanting, more or less numerous drops of oil having replaced them.

Myeloid sarcoma is composed of a stroma of spindle and round cells, but particularly the former, in which the characteristic multinucleated elements are imbedded, with the intervention, usually, of little, if any, visible intercellular substance. The tissue has, therefore, an apparently alveolar construction, and its likeness to alveolar structure is the more striking if the cells have undergone mucoid softening, or have become

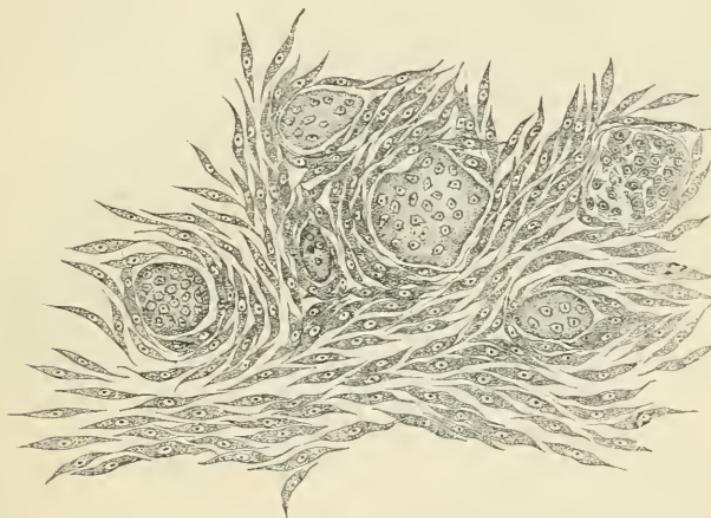
¹ Med.-Chir. Trans., 2d ser. vol. xxi. 1856, p. 121.

² Op. cit. p. 256.

obscured by advanced fatty changes. In other examples the intercellular substance is dimly granular, gelatinous, or even fibrous.

The giant-cells themselves, which are synonymous with the mother-cells of Müller and the osteoclasts of Kölliker, are very similar to those found normally in the medulla of growing bones, especially in the spongy substance, where they are present in greatest number on the surface or at the point of contact of the marrow with the osseous tissue. Like the latter, they are made up of finely granular protoplasm, in which many round or ovoid nuclei are contained; but they differ from them in their relatively large size, sometimes reaching the enormous diameter of $\frac{1}{100}''$ or even $\frac{1}{50}''$, in the greater number and clearness of their nuclei, which

Fig. 2.



are rendered more apparent by the addition of acetic acid, and in the variety and oddity of their forms, which it is impossible to describe. The contour of the cells seems to be influenced by the density of the intercellular substance, being irregularly spherical, ovoid, or lobulated, when the latter is soft, and provided with numerous filiform, branched, or elevated processes, through which contiguous cells are occasionally united, when it is fibroid, in consequence of the protoplasm extending itself into the interstices of the fibrillæ. They also not infrequently present a reddish-brown discolouration, to which the peculiar tint of the tumour of which they form a part is in some degree due.

Although, as has been stated, large multinucleated cells are found in the medulla of the spongy substance, and, indeed, in the cambium layer of the periosteum and in a similar layer which lines the central medullary canal¹ of actively growing bones, the origin of these bodies in myeloid sarcoma cannot be referred, as is done by Robin and Nélaton, to a hyperplastic

¹ Dr. M. Fehr, Langenbeck's Archiv, vol. xvii. p. 232.

process or to a numerical increase of preexisting giant cells. In point of fact the tumours, in the composition of which they are the essential elements, so far from being peculiar to early life, are, as I shall presently show, comparatively rare before the twentieth year, almost four-fifths of the entire number occurring after that age, at which period myeloid cells are seldom, if ever, seen in the epiphyses of the long bones. Mr. Henry Gray¹ states that he has never met with them after the eighteenth and nineteenth years, and in both of these cases their presence seems to have been due to the return of the marrow to its red or foetal state in consequence of disease about the knee-joint. If the cells present in these tumours are the original cells of the medulla, such neoplasms should surely be observed most frequently in subjects of tender years.

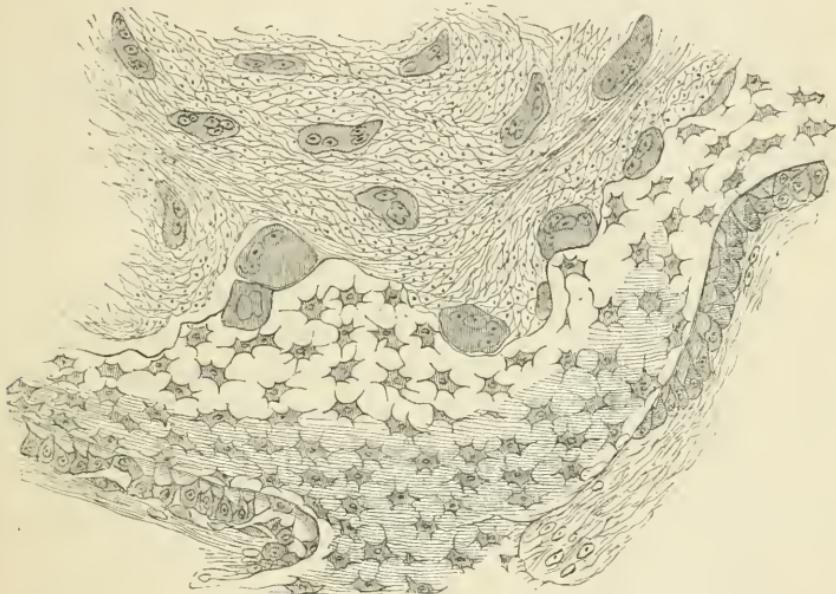
In searching for the histological elements from which giant cells originate, it becomes necessary to inquire into the mode of development and growth of myeloid sarcoma. In consequence of irritation, traumatic or otherwise, the marrow of an areola of the spongy substance or of an Haversian canal, reverts to its foetal state. This is accomplished through multiplication of its essential and accessory elements, namely, the medulla cells, the osteoblasts, the cells of the perivascular connective tissue, the multinucleated cells, and the wandering leucocytes, and through the disappearance of the fat from the adipose vesicles. In this way is formed the indifferent, small-celled, or granulation tissue which constitutes the starting point of nearly all neoplasms. In order that space may be made for the increase of the new tissue, the matrix of the bone is softened down, its earthy matters, or mineral salts, are absorbed, the bone corpuscles are set free and added to the proliferating mass, and irregular spaces or cavities, looking as if the bone had been gnawed out, and known as Howship's lacunæ, in which the sarcomatous tissue is contained, result. Along with this increased activity of the cells and the exudation of nutritive fluid, the capillaries proliferate and give rise to new vessels; and so the process goes on, until a well-defined tumour is formed, the textural disturbances being essentially the same as those witnessed in inflammatory osteoporosis or in fungous or rarefying osteitis.

In its further progress the new material increases at the expense of the spongy substance of the epiphysis in which it is developed, until the original bone finally disappears altogether. As the neoplasm approaches the periosteum it irritates that membrane, setting up chronic ossifying periostitis, through which new layers of bone are constantly being produced, precisely as occurs in the physiological peripheral increase of the bones, to encapsulate the growth in an osseous shell or case. As the sarcomatous tissue continues to increase within the shell, the same liquefactive changes go on in the newly formed bone, as occurred in the original spongy tissue;

¹ Op. cit., p. 143.

but, as it disappears from within, new osseous layers are simultaneously formed by the osteoblastic layer of the periosteum, and, if the process be slow, deposit of new bone goes on *pari passu* with the absorption of the older layers. In this way, as is so strikingly illustrated by the specimen, a more or less perfect osseous capsule is moulded around all central tumours of bone. These histological peculiarities will be best appreciated by a reference to fig. 3, copied from Rindfleisch's *Text-Book of Pathological*

Fig. 3.



Histology, which represents, on the one hand, the bony case in the process of continuous formation by fresh accessions from the osteoblastic layer of the periosteum, and, on the other hand, its disappearance on the side of the growing tumour, which is marked by a well-defined tortuous line, along which the multinucleated cells are lying in Howship's lacunæ.

In regard to the specific elements which are concerned in the production of the giant cells, Rindfleisch¹ believes, with Virchow, that they are the bone cells which are set free in the absorption of the osseous tissue, and become hypertrophied through increase of their protoplasm and repeated division of their nuclei. Dr. Oscar Wyss,² of Breslau, entertains a similar view, and, further, is of the opinion that the myeloid cells break up into the other cell forms which are found in the neoplasm. Dr. Ziegler,³ of Würzburg, has traced their production to proliferating bone cells, and believes that they play the part of reserve or unused elements of the tissue which has replaced the bone. In a case of myeloid sarcoma of the con-

¹ Op. cit., pp. 606 and 608.

² Virchow's Archiv, vol. xxxv. p. 413.

³ Virchow's Archiv, vol. lxxiii. pp. 367 and 374.

dyles of the femur, in which the investing cartilage was thinned and implicated in the disease, Mr. Hulke¹ has described and delineated the direct transformation of cartilage cells into giant cells, and a similar change has been observed by Mr. Maenamara in a tumour of the scapula.² Wegner,³ on the other hand, traces their origin to the proliferation of the endothelium of the walls of the bloodvessels, and believes that they may develop into medulla cells, fibrous tissue, or bloodvessels; while in a very recent paper Malassez and Monod regard them as atypical vessel-forming elements, and denominate the tumours in which they are found angioplastic sareomas.⁴

While in the present state of our knowledge no objection can be urged against the derivation of giant cells from osteoblasts or the formative cells of bone tissue, medulla cells, the perithelium of the capillaries, or wandering cells, through the multiplication of their nuclei and the increase of their protoplasm, or even from the confluence of the cells of indifferent or granulation material,⁵ I am disposed to think that they are nothing more than the liberated and hypertrophied bone cells, in the first place, of the spongy substance in which the growth is developed, and, secondly, of the osseous shell in which it is encased. In fig. 3 the forming and newly formed giant elements are seen so regularly in Howship's lacunæ, along the inner edge of the disappearing bone, that the view of their origin from the bone cells is most alluring.

In support of this opinion reference may be made to the physiological occurrence of giant cells in the developing marrow of young bones, which is, as is well known, formed after the osseous tissue. According to Bredeehin⁶ and other observers the formation of the medullary cavities is coincident with the absorption of the calcified matrix and the release of the bone cells, which are converted into giant elements. Kölliker⁷ has not only confirmed these investigations, but he has shown that myeloid elements are present in and on bones at points where they have been subjected to pressure, hence he terms them osteoclasts, osteophagi, or bone-destroyers, and thinks that they are transformed osteoblasts. Wegner also believes that pressure is the principal condition for the development of giant cells, and he has found them on the dura mater, where it is in contact with the inner surface of the skull, in tumours of the brain, and in hydrocephalus, and on the sacs of aneurisms which had produced absorption of the ribs and vertebrae. I have myself met with them in periosteal

¹ Archives of Medicine, vol. i. p. 110, and plate 13, fig. 4.

² Clinical Lectures on Diseases of Bone, London, 1878, p. 249.

³ Virchow's Archiv, vol. lvi. p. 523.

⁴ Arch. de Phys. Nor. et Path., ser. 2, vol. v. 1878, p. 375.

⁵ Giovanni Weiss. Virchow's Archiv, vol. lxviii. p. 59.

⁶ Centralblatt für die Medicin. Wissenschaften, 1868, p. 563.

⁷ Verhandl. der Würzb. Physik. Med. Gesellschaft, 1872, vol. ii. p. 4.

sarcomas, attended with slight erosion of the shafts of the long bones, although they were not present in other parts of the neoplasms; and their absence from peripheral sarcomas may be ascribed to the fact that the bones upon which they are seated are not constantly disappearing, as is the case in the central tumours. Rustizky¹ has arrived at similar conclusions, although he does not believe that the absorption of bone is necessarily attended with the production of giant cells. Finally, it may be mentioned that multinucleated elements are found on the provisional or periosteal callus of fractured bones, in caries, necrosis, rarefying osteitis,² in the dentine of deciduous teeth, and in granulations growing into bone.

A very striking illustration of the derivation of myeloid from bone cells is afforded by a case of sarcoma reported by Bousseau,³ in a man of sixty, in which a red, denuded, bosselated, and very firm tumour, as large as the fist, seated on the exterior of the head of the tibia, communicated by a narrow pedicle with a mass within the bone. The latter contained large numbers of giant cells imbedded in fusiform and round cells, while the former was composed entirely of spindle-celled tissue.

From the preceding considerations, the pathological significance of giant cells and their relation to the central sarcomata are very evident. Originating as they do from the bone cells, to constitute a myeloid tumour, they should be present not only at the circumference, but throughout the entire neoplasm, since, in its onward progress, osseous tissue has constantly been absorbed. Hence, as Rustizky states, they merely indicate that bone was a constituent of the matricular tissue of the new growth. On this account, periosteal sarcomas, which contain only a few giant cells at their points of contact with the shafts of the long bones, can readily be distinguished from the true myeloid sarcomas which start from the medulla.

In shape, giant-celled sarcomas are usually spherical or ovoid. Their surface is commonly smooth and regular, although it may be uneven, bosselated, or lowly-lobed, or it may be divided into large nodulated lobes by deep grooves, in which the adjacent muscles, tendons, nerves, and blood-vessels lie. They are distinctly circumscribed, and isolated from the surrounding tissues by an investing capsule, composed of periosteum or of bone, or of both of these tissues. In the majority of cases the cyst is partly bony and partly membranous; in a large number it is entirely periosteal, while, in about sixteen per cent. of all specimens, it forms a perfect osseous shell—the mode of formation of which has already been described—which is commonly thin, delicate, fragile, and crepitant under slight pressure,

¹ Virchow's Archiv, vol. lxix. p. 202.

² See a paper by Professor Koenig, of Rostock, entitled "Der Vorgang der Rarefizirende Ostitis unter der Einwirkung der Riesenzellen" (Deutsche Zeitschrift für Chirurgie, 1873, p. 502).

³ Bulletins de la Société Anatomique de Paris, 2 ser., vol. xii. 1867, pp. 426 and 640.

although, as in the example here recorded, it may attain the thickness of half an inch, and contain cavities filled with sarcomatous tissue.¹ Instead of presenting itself in its usual form of fibrous tissue interspersed with plates of bone, one-half of the capsule may be osseous and the other half membranous, as, for example, in a tumour of the head of the tibia, the upper half of the cyst was made up of the thinned articular cartilage and the periosteum, and the lower half of osseous tissue which was continuous with the shaft of the bone. The relation of the capsule to the surrounding parts is usually very simple, the muscles and other soft structures being merely stretched, thinned, or, perhaps, the seat of fatty changes. Now and then the sheaths of the tendons are converted into thin bony canals, as in a case under the care of Langenbeck,² or the tendons, covered by normal synovial membrane, glide in bony canals developed in the osseous shell, as in the case of Larrey.³ In a unique instance of myeloid tumour of the head of the tibia, recorded by Cadiat,⁴ "a species of vast serous burse" isolated the growth from the adjacent tissues.

On section, the epiphysis of a long bone looks as if it had been replaced by a mass of soft structure, surrounded by a capsule, which is continuous, on the one hand, with the articular cartilage, and, on the other hand, with the periosteum of the shaft, the latter of which terminates abruptly in the midst of the tumour, although, in rare cases, the medulla of the shaft and the neoplasm are separated by a plate or plug of new bone.⁵

The tissue of the tumour itself presents such peculiar appearances that there is usually little difficulty in recognizing myeloid sarcoma with the naked eye. The cut surfaces, in typical specimens, in which the cellular elements have not undergone retrograde changes, are, especially in the more recent portions of the growth, of a uniform dark red, reddish-brown, or maroon colour, not unlike that of coarse muscular fibre which has been exposed to the action of the air, or resembling the tissue of the heart, or the splenic pulp. In other examples, and these are the most common, the tint is rosaceous, pink, or reddish-buff, mottled with spots or blotches of crimson, bright-red, cherry, or dark-brown. When fatty degeneration is far advanced, and this is not infrequent, the material is of an amber, yellowish-white, or light-buff hue, with points of deep-red or crimson colour, or between the pale-yellow or straw tints and the crimson, there are many intermediate shades, thereby producing a remarkable marbled aspect. Now and then the predominant colour is grayish, pearly, glistening, or semitransparent, in which event a large admixture of spindle-

¹ Mr. Borlase Childs has reported analogous appearances. Trans. Path. Soc. of London, vol. vii. p. 362.

² Langenbeck's Archiv., vol. i. p. 143.

³ Nélaton, op. cit., Obs. xliv.

⁴ Bulletins de la Société Anatomique de Paris, ser. 3, vol. viii. p. 372.

⁵ Cadiat, op. cit.; Brodie, Med.-Chir. Trans., vol. xxxix. case 3, p. 129; and page 28 of this paper.

celled or fibrous tissue may be looked for. In all specimens there are yellow areas, which indicate fatty degeneration. These areas may surround the more darkly coloured spots, or a large yellow patch may exist in the centre of the dark-red mass.

Giant-celled sarcomas vary very much in their consistence, the majority possessing that of muscular tissue, although they are easily crushed, while others are soft and pulpy. The firmer forms owe their consistence to young or mature fibrous tissue, while the softer forms find their explanation in fatty transformation.

They are not so vascular as one might be led to expect from their more or less rapid growth, large size, and the interstitial hemorrhages to which they are so liable. As a rule, no large arteries enter, and no large veins emerge from, the tumour, so that the circulation is essentially capillary. In exceptional cases, however, the development of bloodvessels is so excessive, that the tissue seems to be saturated with blood, or is the seat of extensive extravasations, for which reason the term *fungus hematoxodes* has been applied to them. The vessels, indeed, may be so large as to impart pulsation to the mass, whence the names *telangiectatic sarcoma* and *aneurism of bone*, although, in the majority of the pulsating myeloid sarcomas, the vessels are either so slightly developed as to escape comment,¹ or, under minute examination, they are not numerous.² In other examples a large number of small arteries inosculate on the interior of the osteo-fibrous capsule,³ or the latter is lined by an extremely rich vascular network;⁴ or a plexus of capillaries, the walls of which have undergone sarcomatous degeneration, is present in the fibrous bands which intersect the tumour.⁵ In these pulsating tumours, future and more accurate observations will, doubtless, disclose that their vessels are almost always enlarged, varicose, and brittle, and that their adventitia is the seat of small-celled infiltration, as in the case recorded by Labb  .

When they are once fully formed, giant-celled sarcomas exhibit a great proneness to undergo certain metamorphoses, some of which indicate progressive changes, or attempts to develop into the different varieties of mature connective tissue, while others represent retrogressive metamorphoses, due to impairment of the nutrition of their component elements. These secondary conditions of involution, and abortive efforts towards the formation of higher tissues, have led certain writers to constitute varieties

¹ Billroth, Chirurgische Klinik, Wien, 1869-70, p. 367; Godlee, Trans. Path. Soc. London, vol. xxv. p. 202; Langston Parker, Med. Chir. Trans., vol. xxxix. p. 138; Langenbeck, Langenbeck's Archiv., vol. xxi. Supp. p. 331, and Carville, Bull. Soc. Anat. de Paris, ser. 2, vol. xii. p. 475.

² Chassaignac, N  laton, Obs. xxxv., and L  cke, Virchow's Archiv., vol. xliv. p. 322.

³ Robin, N  laton, Obs. xvi.

⁴ Sirus-Pirondi, Ibid., Obs. xxxvii.

⁵ Labb  , Bull. de la Soc. Anat., 2d ser., vol. x. p. 230.

of myeloid sarcoma, as the fatty, cystic, telangiectatic, hemorrhagic, fibrous, calcifying, ossifying, and chondroid, to which there can be no objection, provided these terms be merely employed as prefixes to indicate the nature of the changes that have ensued or designate the existence of certain subordinate tissues.

Of the retrograde changes, by far the most constant and important is fatty degeneration, which manifests itself by the presence of minute granules of fat and drops of oil in the cells, through which they are rendered obscure, and finally converted into granular corpuscles, which disintegrate and disseminate their contents into the intercellular substance. To this change may be ascribed the softness and the creamy, light buff, yellowish-white, amber, or orange-yellow tints of the morbid mass; and to it, in connection with deficient vascular supply, may be referred the yellowish friable nodules which are occasionally scattered through the neoplasm, and which represent the cheesy form of fatty metamorphosis. As still further consequences of fatty changes, the granular corpuscles liquefy and form retention cysts, and hemorrhage is liable to occur from implication of the capillary vessels.

One of the most striking peculiarities of these tumours is the formation of cysts or cystoid spaces, both simple and multilocular, which vary in size from a millet-seed to a fist, and are occupied by fluid, semifluid, or clotted blood, fatty emulsion, or sanguinolent, or clear serous fluid. Their number may be so great as to have replaced almost entirely the original texture, so that the specimen under inspection conveys the impression of being one of cystic disease of the bone. It is to this form of giant-celled sarcoma that Mr. Henry Gray¹ applied the name myelocystic tumour. They are not, however, true cysts, lined by a secreting membrane, but rather irregular spaces or cavities, the walls of which are composed of fibrillated tissue studded with granular fat and drops of oil, and presenting more or less distinct traces of degenerated giant cells, and occasionally stained of a deep orange colour by crystals of haematoxin. Their origin is distinctly due either to disintegration and liquefaction, or mucoid softening, of the elements which have undergone fatty metamorphosis, or to extravasations of blood in the softened fatty areas from rupture of the enlarged and degenerated vessels. In the former event, the softening cysts contain turbid, opaque, buff-coloured fluid, or a straw-coloured serosity; while, in the latter mode of formation, the extravasation cysts are filled with blood or coagula, or, in the event of the absorption of the solid constituents of the blood, with a sanguinolent fluid.²

In connection with extravasation cysts, reference may again be made to the vascularity of these tumours. That newly-formed vessels are some-

¹ Med. Chir. Trans., vol. xxxix. p. 121.

² The mode of formation of these cysts has been carefully studied by Dr. Bristow, Trans. Path. Soc. Lond., vol. vii. p. 370.

times present in enormous numbers, and are much dilated, and that they easily rupture and give rise to considerable interstitial bleedings, is shown by the foregoing considerations, and by the fact that not a few of these tumours have been confounded with aneurism, whence their various names telangiectatic and hemorrhagic sarcoma,¹ hematoma, fungus hematodes, and aneurism of bones. In the majority of the ten examples of giant-celled sarcoma, previously alluded to, in which the pulsation was due to inherent changes and not to overlying arteries, the mass of the tumour was converted into cysts filled with blood in various stages of consistence, but principally in the form of black clots or a syrupy fluid. In the case of Lüeke, however, in which, in addition to expansile pulsation, there was a short systolic murmur that disappeared on compression of the femoral artery, through which the volume of the tumour was also diminished, there were no cysts, the material of which the growth was composed being soft, smooth, and marked with clear red spots, and fed by a moderate number of large vessels. From these reflections, and from the fact that the earlier recorded cases of aneurism of bone consisted of a large sac filled with fluid or clotted blood, I am disposed to believe with Nélaton,² Volkmann,³ and Lücke,⁴ that the vast majority of so-called aneurisms of bone are nothing more than pulsating giant-celled sarcomas, if not with Virchow,⁵ Landi,⁶ and Broca,⁷ that such an affection does not exist.

In the firmer forms of tumour, or in fibrous myeloid sarcomas, it is not uncommon to meet with irregular masses of a dense, translucent, grayish-white, glistening character, which are made up of large fusiform elements or of interlacing bands of fibrous tissue. In other examples, the appearances are very similar to those presented by a section of the spleen, fibrous trabeculae being given off from the inner surface of the capsule, which, by their union, constitute an areolar framework, in the interstices of which the brownish-red characteristic material of the growth is contained.

Calcification and ossification of giant-celled sarcomas are far less frequent than in peripheral sarcomas, being present in only twenty per cent. of all cases; but these changes are singularly interesting from the fact, as I shall have occasion to show, of their occurring in the majority of the growths which present malignant features, and which, on that account, are very analogous to the ossifying periosteal sarcomas of the shafts of the long bones. Respecting these changes, it is only necessary to say that calcification is far more common than ossification, true bone being rarely

¹ Virchow, op. cit., p. 190.

² Op. cit., p. 230.

³ Pitha and Billroth's *Handbuch der Allg. und Spec. Chirurgie*, Bd. 2, Abth. 2, Ließ. 1, p. 477.

⁴ Ibid., Bd. 2, Abth. I. Heft 2, p. 200.

⁵ Op. cit., vol. iv. p. 68, French translation.

⁶ Amer. Journ. Med. Sciences, January, 1878, p. 278.

⁷ *Traité des Tumeurs*, vol. ii. p. 212, 1869.

encountered, while the deposition of the earthy salts in the intercellular substance, and to a less extent in the cells, is the rule. In sections of tumours undergoing these changes, numerous rough or sharp points can be both seen and felt, and minute examination usually discloses opaque, black, roundish molecules irregularly interspersed through the soft tissue, or forming a network in which the cellular elements are contained. In some specimens bony spicules penetrate the tumour in every direction, and even supply in part the place of the original bone. Thus, in the case of Lawrence,¹ the tibia, which had disappeared for five or six inches, was substituted by a framework of osseous fibres and plates, which traversed the bony sac in all directions, and connected the articular cartilage of the tibia with the lower portion of that bone. In other examples, osseous plates are inclosed in fibrous bands, and the walls of the cysts may even be partially ossified. Again, isolated fragments of what is apparently spongy bone are scattered throughout the tumour, or one-half of the growth may be composed of a dense calcareous mass, while the other half is sarcomatous. Finally, as in the case of Berend,² the neoplasm may be constituted by a series of nodosities or lobes, each of which is surrounded by a more or less perfect osseous capsule containing a red tissue.

The occurrence of cartilage in myeloid sarcomas is relatively infrequent; but this combination has been observed by Gray,³ Paget,⁴ Meckel,⁵ and others, in the form of small plates, although rarely in sufficient quantity to justify the prefix chondroid.

Inflammation of these growths may be ranked among pathological curiosities. Mr. Little⁶ has recorded a case in which an abscess opened over the outer condyle, and was found, after amputation, to communicate with a cavity, partially filled with pus, in the interior of the mass. In a case, occurring in the practice of Langenbeck,⁷ there was a fistulous opening in the reddened skin, through which a probe could be passed into the tumour, which occupied the lower end of the radius.

Giant-celled sarcomas of the long bones are most frequent in the lower extremity, and they are almost exclusively confined to the epiphyses. Thus, of 70 recorded examples, the seat of the tumour was in the

¹ Med.-Chir. Trans., vol. xvii. p. 35, and vol. xxxix. p. 133.

² Virchow, op. cit., p. 323.

³ Op. cit., p. 138.

⁴ Op. cit., 3d ed. p. 528.

⁵ Charité-Annalen, vii. p. 93, 1856.

⁶ Trans. Path. Soc. Lond., vol. xiv. p. 245.

⁷ Langenbeck's Archiv, vol. i. p. 143, case 2.

Tibia, upper epiphysis, in 21 cases,	lower epiphysis, in 2 cases	
Femur, " " " 2 "	" " " 17 "	
Fibula, " " " 7 "	" " " 2 "	
Humerus, " " " 5 "	" " " 1 "	
Radius, " " " 5 "	" " " 5 "	
Ulna, " " " 1 "	" " " 3 "	
Femur, ¹ shaft 2	Humerus, ² shaft 1	
Radius, ³ shaft 1.		

These localities show that the medulla of the spongy substance of the articular extremities, and not the medulla of the diaphyses, is the favourite tissue for their development.

They are only slightly more common in men than in women. Of 63 cases, in which the sex is known, 33 occurred in males, and 30 in females.

They do not appear to be inherited; are not met with during infancy and childhood; are not very common during adolescence; their greatest frequency is during the age of maturity, or from 21 to 40 years; while their occurrence is rare during middle and old age. The age at which the affection was first noticed is given in 60 cases, the youngest being 14,⁴ and the oldest years 68,⁵ the sum of the ages equalling 1694 years, making the mean age of its appearance 28.2. These facts are set forth in the following table:—

Age.	No. of Cases.							
10 to 20	14
20 " 30	26
30 " 40	12
40 " 50	3
50 " 60	4
60 " 70	1
								—
								60

Thirty-one subjects recognized previous injury or disease as the exciting causes of the affection. In six instances it was ascribed to blows, in fifteen to falls, in three to sprains, in one to luxation and fracture, in one

¹ Bryant, Trans. Path. Soc., Lond., vol. viii. p. 387, in a lad, æt. 15: the epiphysis was not yet united to the shaft; Peulevé, Bull. Soc. Anat., 2d ser., vol. x. p. 658, in a woman of 54.

² Bristowe, Trans. Path. Soc., Lond., vol. vii. p. 351, in a boy, æt. 18; the shaft and upper epiphysis not yet united.

³ Bryant, The Practice of Surgery, Phila. 1879, p. 873.

⁴ Cadiat, Bull. Soc. Anat., ser. 3, vol. viii. p. 372.

⁵ As the occurrence of this growth after the 39th year is interesting, the following references and ages are considered worthy of record. Thompson, Trans. Path. Soc., vol. x. p. 237, at 68; Brown, see p. 27 of this paper, at 57; Carville, Bull. Soc. Anat., ser. 2, vol. xii. p. 475, at 55; Peulevé, Ibid. ser. 2, vol. x. p. 658, at 54; Ferguson, Trans. Path. Soc., vol. xx. p. 278, at 51; Henry, Ibid. vol. ix. p. 367, at 41; Hulke, Archives of Medicine, vol. i. p. 110, at 41; and Langenbeck, Langenbeck's Archiv, vol. i. p. 143, case 2, at 40.

to fracture alone, in one to a strain in throwing a stone, in one to a kick, and in three to rheumatism. In the majority of these cases the influence of the injury upon the development of the neoplasm is unmistakable. The general health of the subjects was, with few exceptions, good.

Myeloid sarcomas, as a rule, grow more slowly than the other varieties of sarcoma of the long bones, although when they are compared with each other, some are observed to attain a large size in a comparatively short period. For purposes of comparing the rate of increase, tumours occupying the same situation may be selected. Thus, in the head of the humerus, the growth may be as large as two fists in twelve months, or as a child's head in five years, or have a circumference of twenty-eight inches in thirty months, or of thirty-two inches in ten years; in the lower epiphysis of the femur it may acquire a circumference of twenty inches in two years, or a circumference of twenty-six inches in six years; in the lower end of the radius, a diameter of two inches and a half in six months, or a diameter of five inches in ten years. In the last example, the tumour which attained a diameter of two inches and a half was growing ten times more rapidly than the one which was ten years in reaching a diameter of five inches. In the largest tumours both extravasation and exudation cysts are generally met with; but neither the rate of growth nor the volume depends upon these retrograde changes, as might naturally be expected, since it is in just these cases of rapid growth that the texture of the tumour is firm and typical. Certain conditions do, however, favour their increase. Among these are injuries, such as blows, or falls, or even exploratory punctures, or friction with liniments, pregnancy and nursing, of which latter states examples are furnished by Lawrence¹ and Langenbeck.²

Their growth is progressive or continuous, but in about six per cent. of all cases, it is temporarily arrested. Of this occurrence, the most noteworthy example is recorded by Mr. Hutchinson,³ in which a tumour of the head of the humerus, after having acquired about two-thirds of the volume of an infant's head in fourteen months, ceased to grow for four years, when, without obvious cause, it renewed its activity.

During their entire progress, giant-celled sarcomas generally exhibit no tendency to break through their limiting capsules, hence their influence on the surrounding tissues is almost purely mechanical, the overlying and associated structures being, as previously indicated, stretched and attenuated, and not incorporated with the tumour, or implicated by extension of the disease. The skin almost invariably preserves its mobility and natural tint; the subcutaneous veins are usually not enlarged; the muscles, tendons, ligaments, and other soft structures are extended, and, perhaps, displaced; the contiguous bones, as, for example, the fibula when the tibia

¹ Med. Chir. Trans., vol. xvii. p. 35

² Langenbeck's Archiv, vol. xx. sup. pp. 329-331.

³ Trans. Path. Soc., Lond., vol. viii. p. 346.

is affected, are occasionally bent, or slightly eroded, or even absorbed;¹ the joints are commonly not implicated, and the medulla of the shafts of the bones which terminate in the tumour, and the lymphatic glands and distant organs are, as a rule, free from secondary or metastatic deposits.

To these general statements there are exceptions, some of which are notable:

a. The skin is usually discoloured, thin, glossy, and tense, now and then thickened by hyperplastic processes, and not by infiltration with the elements of the tumour, but very rarely adherent or ulcerated, unless as the result of traumatism or exploratory puncture. The subcutaneous veins, which, as a rule, are not enlarged, are greatly dilated in twenty-seven per cent. of all cases.

b. The fibres of the adjacent muscles are liable to become adherent to the mass and to be the seat of fatty, fibroid, and possibly hyaline changes. Occasionally, but particularly when the investing capsule of the growth has been perforated, the fasciculi are separated by nodules of sarcomatous tissue,² and, in a case of Colinheim,³ at the point of contact of the tubers, were zones of a bright red colour, which consisted not only of round and fusiform cells, but also of very numerous and exquisitely developed giant cells, which were, moreover, detected in the intermuscular connective tissue at a distance of four millimetres from the tubers. This is the best example of local infection on record. In the case of Bristowe,⁴ the intermuscular veins of the deltoid were enlarged and distended by a pulpy tissue, which presented the same minute characters as the tumour itself.

c. The contiguous bones show little proneness to invasion, the only examples of this occurrence that I have discovered being the following:—

A farmer, aged 36 years, presented himself at the clinic of the Jefferson Medical College, June 16th, 1876, on account of a huge tumour of the left humerus, of an elongated globular shape, elastic at points, and the seat of parchment crackling at others, but generally hard from the presence of a dense bony capsule. Its greatest circumference was twenty-eight inches, against eleven inches at the corresponding point of the sound limb, and it extended from two inches above the condyles to two inches above the level of the shoulder. The skin was tightly stretched over the mass, but it was mobile and free from discoloration; and a few of the subcutaneous veins were enlarged. The neighbouring lymphatic glands were sound, and the general health was excellent. Attention was first called to the trouble twenty-nine months previous to his admission, by fracture of the humerus two inches below the joint, which was at once followed by the appearance of the tumour. On disarticulation at the shoulder, by Professor Gross, the upper portion of the axillary border of the scapula had to be extensively gouged away, and the origins of the muscles cut off, in consequence of their involvement by the material of the new growth.

¹ Bennett. Dublin Journ. Med. Sci., Sept. 1, 1877, p. 427.

² Langenbeck's Archiv, vol. i. p. 141, case 5.

³ Virchow's Archiv, vol. xl. p. 286.

⁴ Trans. Path. Soc., Lond., vol. vii. p. 354.

In the case of Berend, recorded by Virchow,¹ the disease was propagated from the head of the fibula to the head of the tibia; and in that of Langenbeck,² a nodule was discovered in the spongy tissue of the humerus, after total resection of the elbow-joint for a giant-celled sarcoma of the upper extremity of the ulna.

s. Notwithstanding the fact that the shaft of the bone usually terminates abruptly in the tumour, its exposed medulla is singularly free from implication, thereby forming a striking contrast with the deposits in the marrow found in connection with periosteal sarcomas. Among the few instances of infiltration of the medulla, that recorded by Sir Benjamin Brodie, and examined by Mr. Gray,³ is worthy of mention.

s. The adjacent articulation occasionally undergoes destructive changes from nutritive disturbances, as has been witnessed by Carville,⁴ Ledentu,⁵ and Langenbeck;⁶ but the investing cartilages of the epiphyses appear almost constantly to oppose a barrier to encroachment on the joint, although they are much thinned and form part of the capsule. That they may, in opposition to the earlier statements on this point, be perforated, is attested by at least two examples. Thus, in the case of Sir Benjamin Brodie,⁷ "the articular surface of the condyles had been entirely absorbed, and the morbid growth had made its way into the cavity of the knee-joint, which it distended throughout, pushing the patella and its ligament forward, absorbing the cartilaginous surface of that bone, and making its way into the cancellous tissue. The cartilage covering the head of the tibia had the growth adhering to it in some parts, whilst in others the cartilage had been absorbed, and the morbid structure had made its way into the cancellous tissue of this bone, but only to a very slight extent." In the case recorded by Mr. Moseley⁸ the cartilage was "perforated, but the joint was but slightly affected."

In the majority of examples of implication of the neighbouring joint, however, the cartilage of incrustation remains whole. In the case of Dr. L. A. Stimson,⁹ of New York, the tumour had "broken through the intercondyloid notch, and sent a bony column, half an inch in diameter, between the crucial ligaments, down to the anterior edge of the articular surface of the tibia." The capsule of the joint was also perforated, and the neoplasm surrounded the patella and eroded its anterior surface. In the remarkable instance of calcifying giant-celled sarcoma of the head of

¹ Op. cit., pp. 323 and 337.

² Langenbeck's Archiv, vol. xxi. sup. p. 329.

³ Med. Chir. Trans., vol. xxxix. p. 128.

⁴ Bull. Soc. Anat., 2d ser., vol. xii. p. 475.

⁵ Ibid., 2d ser., vol. ix. p. 515.

⁶ Langenbeck's Archiv, vol. xxi. sup. p. 329.

⁷ Med. Chir. Trans., vol. xxxix. p. 131.

⁸ Trans. Path. Soc., Lond., vol. xx. p. 281.

⁹ The Medical Record, Jan. 6th, 1877, p. 11.

the tibia, reported by Mr. Butlin,¹ the erneial ligaments were converted into a firm calcified mass, and the disease was propagated through them into the lower portion of the femur, which, however, was only slightly affected. In the remaining instances of invasion of the joints the reports are as follows: "In the notch between the condyles, the tumour formed one or two gelatinous prominences into the joint behind the synovial membrane."² Projecting into the knee-joint from the internal condyle, and covered only with the thinnest film of articular cartilage, was a bluish growth, looking like a venous nævus;³ and "the synovial cavity was also entirely occupied by the growth which filled the space between the articulating surfaces of the femur and tibia."⁴

The above seven examples demonstrate that a more extended examination does not confirm the positive assertion of Mr. Erichsen,⁵ who says: "It is a remarkable fact, long ago pointed out by Petit, and more recently insisted on by Richet, and which I have often had occasion to verify, that, although the epiphysis may have been completely degenerated, the cartilage of incrustation and the neighbouring joint never becomes implicated."

ζ. Of extreme interest, from a pathological as well as a practical point of view, is the condition of the lymphatic glands directly connected with the tumour, which are stated to have been hypertrophied in only eight instances. In two, in which further histories are wanting, and in which the structure of the glands appears to have escaped notice, these organs were involved; in the first,⁶ one gland in the groin was hypertrophied, and, in the second,⁷ both groins were affected, but to a greater extent on the side corresponding to the tumour, the gland being of "the size of a crown-piece and spongy to the touch." In six examples the glands were merely enlarged from irritation. In that recorded by Dr. E. H. Bennett,⁸ a gland over the saphenous opening diminished at least one-third after amputation, from which the patient recovered. On dissection of the limb, some enlarged glands were discovered in the popliteal space, which were found to contain only normal elements. In the case described by Mr. Godlee,⁹ which also recovered, one or two glands in the groin were decidedly smaller two months after amputation. In the instance of Mr. Little,¹⁰ the glands in the groin subsided after amputation, and recovery

¹ St. Bartholomew's Hosp. Rep's, vol. x. p. 121. Mr. Butlin records this case as being one of round-celled sareoma; but the slow progress of the disease, and the minute examination, which showed it to be "for the most part round-celled, but containing not a few mycloid cells," have led me to include it among the giant-celled growths.

² Godlee, Trans. Path. Soc., Lond., vol. xx. p. 202.

³ Hulke, ante.

⁴ Sydney Jones, Trans. Path. Soc., Lond., vol. x. p. 246.

⁵ The Science and Art of Surgery, Phila. 1878, vol. ii. p. 208.

⁶ Brichetau, Bull. Soc. Anat., 2d ser., vol. 3, p. 470.

⁷ Moseley, ante.

⁸ Ante.

⁹ Ante.

¹⁰ Ante.

followed. The popliteal glands, which were found to be hypertrophied on inspection of the limb, were simply hyperplastic. In the case of Chassaing-nac,¹ the enlarged glands in the groin gradually diminished after amputation, and the man was alive four years subsequently. In the case of Mr. Hutchinson,² which, as will be presently seen, was remarkable for being an instance of local return and general infection, the infra-axillary glands formed a mass as large as the fist; but they were merely loosely connected with each other and with the surrounding tissues, and only showed "microscopical indications of hypertrophy and inflammatory conditions." Finally, in the case of Mr. Butlin,³ the enlarged and tender femoral glands had subsided to nearly their normal size one month after successful operation. The absence of sarcomatous elements from the glands submitted to minute inspection; their diminution or disappearance after operation; the non-occurrence of periadenitis, through which they remain isolable and unattached to the connective tissue in which they are imbedded; their freedom from ulceration, and their non-involvement in four other examples of general dissemination of the disease, are facts that lead to the conclusions that, in giant-celled sarcoma, glandular enlargement is the effect of irritation and not of specific infiltration, and that systemic infection takes place through the vascular, and not through the lymphatic, system.

Like the other varieties of sarcoma of the long bones, myeloid tumours are, therefore, occasionally locally infectious, as is evinced by the invasion of their own osseous capsules,⁴ the contiguous bones and joints, and the surrounding soft tissues.

η. Giant-celled sarcomas, as a rule, are confined to the parts in which they originate and grow; but they sometimes recur after removal, and even exhibit more marked signs of malignity, by forming metastatic or secondary tumours in distant organs. As Nélaton, Gray, and other writers are disposed to regard them as being habitually of a benign character, I shall offer no apology for giving abstracts of the recorded cases of generalization, from which it will be observed that no doubt can be entertained of their not very infrequent malignant nature.

CASE I. Dr. Stimson⁵ amputated the thigh of a man, aged 37 years, on the 31st of November, 1876, on account of myeloid sarcoma of the lower epiphysis of the femur, of ten months' standing. The tumour, which had invaded the knee-joint, was composed of round and fusiform cells, and "of large quantities of myeloplaxes, especially near the points of ossification." In about eight weeks, the patient began to cough and spit blood, and some weeks subsequently a hard, flat tumour appeared on the left frontal bone.

¹ Nélaton, op. cit., Obs. xxxvi. and Gazette des Hôpitaux, 1863, p. 25.

² Trans. Path. Soc., Lond., viii. pp. 351 and 355.

³ Ante.

⁴ Vide page 27, and Trans. Path. Soc., London, vol. vii. p. 362.

⁵ The Medical Record, vol. xii. 1877, pp. 11 and 524.

Death ensued on May 4, 1877, or five months and a half after the operation, when the lungs were found to be filled with nodules, varying in size from a cherry to a child's fist, which were composed of round and fusiform cells. In a few there were calcareous deposits; while a piece of fully-formed bone, an inch in diameter and one-third of an inch thick, was found in the largest nodule. The frontal bone was occupied by an ossifying sarcoma;¹ and three ossifying minute red growths were seated on the under surface of the dura mater where it was adherent to the frontal tumour, which were made up of similar elements. The lymphatic glands, the remaining viscera, and the stump were free from disease.

CASE II.² A labourer, 30 years of age, underwent amputation of the thigh, Oct. 7, 1856, for a typical giant-celled sarcoma of the head of the fibula, of seven months' duration. In two years, or on Oct. 20, 1858, he returned to the hospital with a tumour, as large as the closed fist, on the inner side of the thigh, and two smaller ones on the outer side, all of which, were found to consist of myeloid tissue, contained in thick, and partly bony, capsules, which were not connected with the femur. On death from acute pleurisy, Nov. 26, Dr. Wilks found three or four pendulous giant-celled tumours, one of which was as large as the heart, growing from the surface of each lung, and looking like supernumerary lobes. The lymphatic glands, and all of the other organs were healthy.

CASE III.³ A rheumatic woman, aged 43 years, had suffered for twelve months from pains in the right shoulder, which, in six months, became laminating and excessively severe. About two months before admission into the hospital, under the care of Mr. Mitchell Henry, she first noticed a swelling, which at length produced such extreme suffering as to demand disarticulation, on the 10th of September, 1857. Much of the tumour, which was as large as an orange, was composed partly of dense osseous tissue, and partly of firm fibroid material, and was continuous with a soft, reddish substance which occupied the medullary cavity of the head of the humerus. The external parts of the growth were made up of fibroplastic tissue and a few myeloid cells, while the internal red portion was composed almost entirely of giant cells. When she was discharged at the end of five or six weeks, there was some suspicious tumefaction about the shoulder; and on her return, on the 16th of November, or in eleven weeks after the operation, her health was entirely broken down, and there was an ulcerated tumour of the stump, which increased, until it attained the size of a foetal head, and was the seat of excessive pain and a profuse, fetid discharge.

After death, on the 16th of December, dissection disclosed a mass growing from the neck of the scapula, and including the axillary glands, which, however "could not be made out distinctly," which was composed of calcified bosses, divided by fibrous septa and loose clots of blood, and of softer tissue. The latter was made up of small nuclei and oval and fusiform cells in a finely granular gelatinous matrix, and numerous giant elements were present in nearly every part of the tumour. In each lung were from twenty to thirty superficial nodules, which varied in size from a pin's head to a

¹ Virchow (op. cit., vol. ii. p. 321) states that he has never seen an osteoid metatatic tumour in a bone.

² Guy's Hosp. Reps., ser. 3, p. 174, and Trans. Path. Soc., Lond., vol. ix. p. 244.

³ Trans. Path. Soc., Lond., vol. ix. p. 367.

pea, and were composed of calcifying small-celled tissue, in which giant cells were not abundant. The other viscera were normal as regards secondary deposits.

CASE IV.—Mr. J. Cooper Forster¹ has recorded the case of a boy of 18 years, in whom, on the 18th of May, 1857, Mr. Cock amputated through the thigh for a myeloid tumour of the head of the fibula, of about five months and a half standing. Masses of bone were interspersed through an encephaloid tissue, "but here and there were portions which presented cells of a true myeloid character," or, as Dr. Wilks,² who describes the sequel, under the title of a "Case of Osteoid Cancer combined with Myeloid Disease," states, the soft white material was composed of a "mass of nucleated cells; interspersed with these, however, were numerous polynucleated cells with branching processes, such as are styled myeloid." At the end of August the patient had become paraplegic, and death ensued on the 16th of October. There was no return of the disease in the stump; and all the organs, excepting the lungs and spine, were healthy. Each of the former contained about twenty red, vascular nodules, of which the largest were of the size of a marble. They were composed of calcareous granules, and of cells similar to those found in the original tumour. The lower dorsal vertebrae were infiltrated with the same histological elements; their bodies were destroyed posteriorly, the theca of the cord was surrounded by the new material, and the medulla was disorganized.

CASE V.—Mr. Hutchinson³ removed, on the 14th of May, 1856, the upper third of the humerus, along with the acromion and coracoid processes, and a mass of enlarged glands, of a woman 33 years of age, on account of a tumour of the size of an infant's head, of four years and ten months' duration, which contained deposits of soft spongy bone, and was composed of fibroplastic cells and many large polynucleated cells, the former of which predominated. In three weeks an enlarged gland was detected in the posterior triangle of the neck; in ten weeks the main wound had closed, but about this time a fungus appeared at the unhealed wound left by the removal of the infra-axillary glands, and the upper divided end of the humerus became tumid. The disease continued to progress in each of the three different situations; the cicatrices of the incisions gave way, a large fungus projected, and the woman finally died, about five months after the operation, from the effects of repeated hemorrhages from the lower fungus.

The recurrent growths of the axilla and of the periosteum of the shaft of the humerus, at the point of section, "exuded most plentifully a white cream-like juice, which abounded in free nuclei, and contained some large cells, having from one to three nuclei." In the right lung were several deposits of infiltrated soft "cancer" resembling the growth in the axilla.

In all of these cases it is interesting to observe that the lungs were the seat of secondary tumours, so that, in this regard, the likeness between myeloid and peripheral sarcomas is complete. In four instances the bones, or their investing membrane, were also affected; but, with the exception of the dura mater, no other tissues or organs were involved.

¹ Trans. Path. Soc., Lond., vol. viii. p. 389.

² Ibid., vol. ix. p. 377.

³ Ibid., vol. viii. p. 346.

These illustrations of the malignity of giant-celled sarcoma demonstrate conclusively that the idea of their absolutely innocent character must be abandoned. The explanation given by certain observers, as, for example, Nélaton,¹ Wilks,² and Forster,³ that malignity is witnessed only in the "mixed" forms, is not tenable, since, as was demonstrated by Virchow,⁴ giant cells are not the only elements found in these tumours, fusiform and round elements always being present in varying quantities, through which this variety of central sarcomas is, in reality, a "mixed" growth. Indeed, as Virchow states, the same objection might just as well be urged against the majority of cases which recovered after operation. Nor will it do, with Hutchinson,⁵ to regard the original tumour as being of a myeloid nature, and the secondary deposits as cancerous, since at the time this case was recorded the nature of morbid growths was determined by the presence of so-called cancer cells in the juice, and not from properly prepared sections.

There is a point, however, in connection with the histological construction of these malignant giant-celled sarcomas, with which I have been particularly struck, namely, the presence of granules or masses of calcareous matter or of true bone in their interior, through which they have a close likeness to the periosteal osteoid or ossifying sarcomas, which are excessively malignant. In all of the foregoing instances, except Case II., these elements were found, and it is quite possible that bone was overlooked in that example, since the recurrent growths in the stump were surrounded by capsules which were in part osseous, although that tissue seems to have been absent from the secondary deposits in the lungs. In Case I., the mass was pervaded by numerous points of ossification, and its lower portion was occupied by a piece of bone, from which a column was extended, between the crucial ligaments, to the tibia. The metastatic nodules in the lungs contained calcareous points, and a piece of fully formed bone was found in the largest nodule. The tumour of the frontal bone was ossifying, and those of the dura mater were calcifying. In Case III., the primary tumour was partly composed of dense osseous tissue, while the recurrent growth of the scapula was made up of calcified bosses, and the nodules in the lungs were calcifying. In Case IV., masses of bone were interspersed through the tissue of the original growth, and the secondary deposits in the lungs and vertebrae were the seat of calcareous granules. Finally, in Case V., deposits of soft spongy bone existed in several parts of the original tumour; but the recurrent and secondary growths, the examination of which, however, was certainly not thorough, were free from calcareous or ossific changes.

¹ Op. cit., p. 332.

² Lectures on Pathological Anatomy, Edited by Moxon, p. 59.

³ Loc. cit.

⁴ Op. cit., p. 336.

⁵ Loc. cit., p. 352.

When it is remembered that calcifying and ossifying periosteal sarcomas are almost as malignant as the periosteal sarcomas which are not characterized by these degenerations; and that the secondary deposits, which are also most frequent in the lungs, are also the seat of similar changes, not only is the analogy between malignant central and peripheral sarcomas very striking, but one is tempted to ask, "Is not generalization, in some cases at least, due to these metamorphoses?"

In the solution of this question, it is necessary to determine, in the first place, whether the osteoid myeloid sarcomas are really more malignant than those in which calcareous or ossific changes are not observed; and, secondly, whether the mineral salts may not act as the carriers or transporters of the infecting material.

1. Out of 51 cases, of which I have full histories, 3 died without operation, and 48 underwent amputation or excision.¹ Of the latter, 15 died from the effects of surgical interference, and 33 recovered, but of these 5, that is to say, the cases above recorded, terminated fatally from general dissemination of the disease, at periods which varied from three months to two years, the average being eight months. Excluding 11 cases, in none of which does the history extend beyond two months after the operation, and, using for the purposes of comparison only those which remained well for periods which extended over three months and upwards, we have 22 cases, of which 5, or 22.72 per cent., died with recurrence of the disease, and 17 recovered. For convenience of reference, all of the recoveries are appended in the subjoined table, the cases used in the above comparison terminating with that of Mr. Morris, or No. 17.

With regard now to the degree of malignity of the osteoid, that is to say, the calcifying and ossifying varieties of myeloid sarcoma, the descriptions state that these metamorphoses were present in 7 of the 22 recoveries from operation. Of these, as I have pointed out, the four cases of Stimson, Henry, Forster, and Hutchinson, subsequently succumbed from generalization, while in 3 the deposits did not exert any influence upon the duration of life, since in Larrey's case the patient was alive six years and a half after the operation, and the disease had existed ten years before amputation was resorted to; while in the case of Bristowe, the man died of pulmonary phthisis five years after disarticulation at the shoulder, and in the case of Paget, the woman survived amputation of the thigh for "many years." These cases are numbered 8, 12, and 13 in the table. Of the remaining 15 examples in which the texture of the tumour was free from the mineral salts, only one, that of Wilks, died, and in this case six or eight large metastatic tumours were discovered in the lungs.

¹ Ten additional cases were subjected to amputation; but as they were recorded immediately after operation, and I could not trace their further histories, they were only used in the study of the general pathology of giant-celled sarcomas.

Table of Recoveries after Operations for Giant-celled Sarcoma.

Case	No.	Seat.	Duration.	Operation.	Latter history.	Total duration of life from first notice of disease.	Operator and recorder.	Reference.
1	F. 18	Upper humerus	?	Disarticulation	No return in 2 yrs.	?	Brodie and Gray	Med. Chir. Trans., vol. xxxix, p. 127.
2	M. 23	Lower femur	18 mos.	Amp. thigh	" 5 yrs.	6 yrs. 5 mos.	" " "	" " "
3	M. 36	" "	6 mos.	" "	" 10 "	16 years	Parker and Gray	" " "
4	M. 19	Lower fibula	12 mos.	leg	" 4 "	5 years	Velpeau and Nélaton	" " "
5	F. 21	Lower femur	14 mos.	thigh	" 5½ "	6 yrs. 8 mos.	Op. cit., vol. xxx, and Gaz. des Hôp., 1863, p. 25.	Op. cit., vol. xxxv, and Gaz. des Hôp., 1863, p. 25.
6	F. 29	Upper tibia	12 mos.	" "	" 4 "	5 years	Chassaignac and Nélaton	Op. cit., Obs. xxxv, and Gaz. des Hôp., 1863, p. 25.
7	M. 29	Lower femur	10 mos.	" "	" 4 "	4 yrs. 10 mos.	Chassaignac and Nélaton	Op. cit., Obs. xxxvi, and Gaz. des Hôp., 1863, p. 25.
8	M. 37	Lower radius	10 yrs.	forearm	" "	6½ " 16½ years	Larrey and Nélaton	Op. cit., Obs. xliv, and Gaz. des Hôp., 1863, p. 25.
9	M. 26	Lower femur	28 mos.	thigh	" "	3 yrs. 5 m.	Billroth	Chir. Klinik, Zürich; 1860-67, p. 639.
10	F. 40	Lower radius	?	forearm	" "	5 yrs. 9 mos.	Langenbeck and Senftleben	Langenbeck's Archiv, vol. i. p. 143.
11	F. 30	Lower ulna	?	Rossec. 4 ulna	" "	6 yrs.	" "	" " "
12	M. 18	Upper ½ shaft humerus	6 mos.	Disarticulation	" 5 "	1½ years	Simon and Bristowe	Trans. Path. Soc. Lond., vol. vii. p. 351.
13	F. 24	Upper tibia	10 mos.	Amp. thigh	" "	many yrs.	Patent	Lect. on Surg. Path., 3d ed., 1870, p. 547.
14	M. 25	Lower femur	2 yrs.	" "	" 2 yrs.	4 years	Cock and Wilks	Guy's Hosp. Rep., 3d ser., vol. xxii, p. 168.
15	F. 24	Upper tibia	6 mos.	Excision lower ¼	" 15 "	1½ years	Bryant	Guy's Hosp. Rep., 3d ser., vol. xxii, p. 314.
16	F. 29	Lower ulna	10 mos.	" both bones	" 8 "	18 months	Lucas	British Med. Jour., April 28, 1877, p. 515.
17	F. ?	Lower radius	10 mos.	Amp. thigh	" 10 "	20 months	Morris	Trans. Path. Soc. Lond., vol. xxv, p. 202.
18	M. 18	Lower femur	4 mos.	" "	" 2 mos.	6 months	Lawrence and Gray	Med. Chir. Trans., vol. xvii, p. 135, and vol. xxxix, p. 133.
19	F. 30	Upper tibia	18 mos.	" "	" 40 days	1½ months	Fergusson and Ulke	Archives of Medicine, vol. i., p. 110.
20	M. 43	Lower femur	18 mos.	" "	" 1 mo.	19 months	Cock and Wilks	Guy's Hosp. Rep., ser. 3, vol. iii., p. 169.
21	F. 33	" "	12 mos.	" "	" 7 wks.	14 months	Marshall and Beck	Trans. Path. Soc. Lond., vol. xxii, p. 210.
22	M. 31	Upper tibia	15 mos.	" "	Recovered	16 months (?)	" "	Langenbeck's Archiv, vol. xx, p. 279.
23	M. 20	Lower tibia	12 mos.	" "	" "	13½ months (?)	" "	329.
24	F. 22	Upper ulna	6 yrs.	Resection elbow joint	No return in 2 mos.	6 yrs. 2 mos.	Langenbeck's Archiv, vol. xxii, supp. p. 333.	
25	F. 26	Upper fibula	15 mos.	Excision ½ fibula	" "	8 wks.	Dub. Jour. Med. Sci., Sept. 1, 1877, p. 247.	
26	M. 37	" "	12 mos.	Amp. thigh	Recovered	13 months (?)	Trans. Path. Soc. Lond., vol. xiv., p. 245.	
27	M. 27	Lower femur	2 yrs.	" "	Recovered	2 yrs. 1 mo. (?)	St. Bartholomew's Hospl. Rep., vol. x. p. 120.	
28	M. 16	Upper tibia	2 yrs. 9 mos.	" "	Recovered	2 yrs. 10 mos.	Bennett Little	

From the foregoing considerations it will be seen that 22.72 per cent. of all cases of myeloid tumours are malignant, and that the degree of malignity may be graded in accordance with the existence or absence of calcareous or osseous deposits, since these were found in the original tumour in four of the five cases of metastasis. Further, it will be observed that the osteoid myeloid tumours are not absolutely malignant, as 42.85 per cent., or 3 out of 7, patients remained well several years after their removal. Finally, in this connection, it may be stated that of 15 examples of giant-celled sarcoma, in which calcification or ossification is not noted, only one was characterized by secondary growths. Hence the prognosis of the latter is as favourable as is the prognosis of some other neoplasms which are considered to be of an innocent nature.

2. How far the mineral salts present in the primary tumour may behave as transporters of the infecting material which gives rise to the secondary growths in the lungs and elsewhere is, of course, open to criticism. That they are active agents in the general dissemination of the disease would not seem improbable from a consideration of the foregoing statements, from which it may be observed that metastatic tumours were discovered in 57.14 per cent. of all instances of calcifying or ossifying myeloid sarcomas, while they were present in only 6.66 per cent. of simple giant-celled sarcomas. The calcareous metastasis itself is due to the absorption of the salts of the imperfect bone of the primary growth, which are set free by a process precisely similar to that which I have already described under the head of the mode of development of these tumours. Saturated, as these salts must be, with the juice or fluid constituents of the original growth, it is not difficult to conceive that they act as the seed of infection of the cells of the parenchyma of the organs to which they are carried, and thereby give rise to secondary nodules, which present the same histological peculiarities as the mother tissue. Be this as it may, however, the fact remains that the calcifying and ossifying sarcomas, whether central or periosteal in origin, are, with the exception of the pure periosteal spindle-celled, and round-celled, the most malignant of all the neoplasms of the long bones.

The duration of life of the subjects of giant-celled sarcoma of the long bones is very variable. In a few instances death has occurred in three, four, five, and six months, while in others it has been postponed for many years, and recoveries are recorded ten and even fifteen years after operation. Unfortunately the cases which pursued a natural course are too few to be of any value in estimating the average duration of life, and in determining whether or not life is prolonged by surgical interference. Of 51 cases, of nearly all of which I have complete histories, only 3 ran a natural course. Of these, 1, that of Dr. Brown,¹ died of general erysipelas, ten years after the first appearance of the disease; in one reported

¹ Ante.

by Peulev  ,¹ the patient died of debility at the end of nine months and a half; while the third, which occurred in the practice of Carville,² terminated fatally from broncho-pneumonia in nine months.

Accurate statements of the duration of the disease up to the date of operation and of the prolongation of life after operation are given in 44 of the remaining 48 cases,³ from which it appears that the duration of life varied from three months to sixteen years and a half, the average having been 40.9 months, the majority of the patients being still alive at the date of the reports. 33 patients⁴ remained well for periods which ranged from a few weeks to fifteen years after the operation,⁵ while 15 died from the effects of surgical interference. Hence the average duration of life from the first observation of the disease among the 28 subjects⁶ who survived resection or amputation was 54.8 months, or rather more than four years and a half.

Among the recoveries, that recorded by Bristowe deserves particular notice, as secondary deposits in the lungs might naturally have been anticipated from the condition of the neighbouring bloodvessels. After amputation at the shoulder, on account of a myeloid sarcoma of the head of the humerus, the anterior flap was seen to contain numerous veins, of the size of a goose-quill, which passed from the tumour into the substance of the deltoid muscle, and were filled with soft, pulpy growths, which were composed of giant cells. After the operation a considerable portion of the flap sloughed, and it was thought highly probable that the slough included all the diseased veins. On death from phthisis, five years subsequently, there were no evidences of metastatic deposits.

As I have already pointed out, recovery after operation is liable to be permanent, since of the 22 patients previously alluded to who underwent surgical treatment, 17 remained well for periods which ranged from eight months to fifteen years, the average being 58.7 months; while in 5 in which general infection occurred, the average duration of life after operation was 8 $\frac{3}{4}$ months. In all of the latter the lungs were affected secondarily, and, in 4, there was also recurrence locally, these phenomena appearing on an average, at rather more than six months after surgical interference.

¹ Bull. Soc. Anat. Ser. 2, vol. x. p. 658.

² Ibid., ser. 2, vol. xii. p. 475.

³ Cases 1, 10, 11, and 13 of the table are omitted, as definite information on one or the other of these points is wanting.

⁴ This number includes the 28 cases of the table, and the 5 instances of recurrence of the disease after recovery from operations.

⁵ In the table, where "recovered" alone is mentioned under the head of "later history," I have assumed that the patient was well four weeks after surgical treatment.

⁶ The cases of generalization are included in this computation, and cases 1, 10, 11, and 13 of the table are excluded; but it is interesting to note that the patients were alive, respectively, 2, 6, 4, and "many years" after surgical interference.

The previous duration of the disease appears to exert an influence upon local and general recurrence, since in the cases of permanent cure the tumour had existed, on an average, 25 months before operation, while in the cases of recurrence, the average duration before operation was $16\frac{1}{2}$ months. In the latter cases, also, the tumour had acquired a large volume in a short space of time, so that the general rule may be established that a rapidly growing myeloid sarcoma is more liable to prove malignant than one which runs a slow course.

While it is doubtless true, as Virchow declares,¹ that in myeloid, as in the other varieties of sarcoma, there is a period during which the tumour remains innocent, and is amenable to surgical treatment, and that early and effectual removal is the only measure to guard against recurrence, general pathology fails to indicate what that period is. Indeed, it may be accepted as an axiom that early operations are not more successful in prolonging life than those practised at a late date. In the cases of recurrence, for example, the disease had existed, respectively, two, five, seven, ten, and fifty-eight months; four, therefore, having been subjected to operation within a year from the first observation of the growth, and yet local and general infection and death ensued just as rapidly in the cases of five and ten months' duration, as in the case of fifty-eight months of existence. So, too, an inspection of the table of recoveries demonstrates that the best results are obtained when operations had been practised at comparatively late periods. Hence the prognosis rests less upon the time of operation after the first appearance of the disease, than upon the histological construction of the tumour. If, after removal, the latter is found to be free from calcareous and osseous degeneration, it may safely be assumed that the disease will not return, whereas if those transformations are present, the chances are against the patient.

Giant-celled sarcomas give rise to symptoms which, while they vary according to the size and consistence of the tumour, are, unfortunately, not distinctive. Hence their diagnosis is often exceedingly difficult and embarrassing.

In 50 per cent. of all cases the disease is ushered in by pain, which is usually of a dull aching character, but is occasionally lancinating and very severe, and is succeeded by a firm, immovable swelling in the vicinity of a joint. In 31 per cent. of all cases pain and tumefaction are observed simultaneously; while in 19 per cent. the affection begins insidiously, swelling alone being the first sign noticed by the patient.

Having once formed, the tumour grows, as a rule, slowly and continuously; is free from pain and tenderness; the temperature is not elevated, the overlying skin is normal in texture, colour, and mobility; and the subcutaneous veins and lymphatic glands are not enlarged.

¹ Op. cit., p. 340.

To these general statements the following exceptions must be noted: in 29 per cent. of all cases the tumour increases rapidly, while in 6 per cent. its growth is temporarily arrested; in 40 per cent. the pain perseveres throughout the entire course of the affection, being commonly moderate, rarely continuous, and only severe and harassing in about one-third of the cases, when it generally depends upon implication of the corresponding articulation; in 14 per cent. the neoplasm is tender to the touch, but, as a rule, only slightly so; the temperature is elevated in 6 per cent.; the skin is altered in 33 per cent., the most common changes being discoloration and tenuity, ulceration being a curiosity; the lymphatic glands are the seat of tumefaction, from irritation, in 16 per cent.; while, finally, the subcutaneous veins are much enlarged in 27 per cent. of all cases.

The tumour itself has a spherical or ovoid form, and its surface is generally smooth and regular, although it may be bosselated or lobed. If its constituent elements have not undergone retrograde metamorphoses, and if its investing capsule be merely membranous, its consistence is firm, tense, and elastic; but, in the event of cystic, hemorrhagic, or advanced fatty changes, it is soft, and apparently fluctuating. Should the capsule be partly periosteal and partly bony, as usually happens, it will feel hard, and perhaps crackle, at some points, and elastic, or soft, or fluctuating at others; while, if it be completely osseous, as occurs in about 16 per cent. of all cases, it will be densely hard, although when the shell of bone is thin, parchment-like crepitation is elicited, or fracture even occurs under manipulation. On exploratory puncture blood nearly always issues, and sometimes freely, especially if the growth be very vascular or pulsates. In other instances, the fluid of softening cysts escapes from the artificial opening. In rare cases pus may even appear, as in two examples the tumour was found to be suppurating.

Pulsation when present, as it was in 20 per cent. of all the cases of which I have complete histories, is a most valuable sign, since it has not been observed in other neoplasms, whether central or peripheral, of the long bones, excepting six examples of the other varieties of central sarcoma, five of which occupied the shafts, and one the epiphysis, and in one case of osteoid sarcoma surrounding the lower end of the femur. Allusion is, of course, made to pulsation resident in the growth itself, and not to pulsation transmitted to it from contiguous arteries. It has not, curiously enough, been met with in myeloid tumours of the bones of the upper extremity; but has been recorded four times in giant-celled sarcoma of the head of the tibia,¹ four times in the condyles of the femur,² and in the upper and lower epiphysis of the fibula, respectively, once.³

Finally, a large, immovable, spherical, slowly-growing, probably pain-

¹ Cases of Labb , Chassaignac, Sirus-Pirondi, and L cke.

² Cases of Billroth, Godlee, Carville, and Robin.

³ Cases of Langston Parker, and Langenbeck.

ful, and possibly pulsating tumour, of varying degrees of consistence, occurring in the articular extremity of a long bone, between the fifteenth and fortieth years, or at about the twenty-eighth year, unattended by changes in the integuments, or by enlargement of the subcutaneous veins and lymphatic glands, and not marked by impairment of the general health, may be pronounced to be a giant-celled sarcoma.

In the treatment of this class of tumours, general measures being worthless, no time should be lost in resorting to amputation or excision. Although surgical interference has been followed by a mortality of 31.25 per cent. there can be no reasonable doubt that it has frequently succeeded in preventing local and systemic infection, as well as prolonging life. The more rapid the growth of the tumour, the more reason there is for early operation. Indeed, in view of the difficulty in determining the true nature of the neoplasm in its incipient stages, delays are extremely dangerous, since, instead of having to deal with a pure myeloid sarcoma, the disease may eventually prove to be an osteoid sarcoma, or a small-celled medullary sarcoma, in which events, valuable time will have been lost, and the patients have been exposed to the dangers of local infection and general dissemination.

In selecting an operation the golden rule should be observed to go as far as possible from the seat of disease, without needlessly jeopardising life. The reasons for this line of conduct will be perfectly clear, if it be remembered that the overlying soft parts, the contiguous bones, and even the joints, may be involved by extension of the disease. Hence it is that when operations have been practised next the trunk, or in close proximity to the tumours, the prognosis is bad, as, in the event of reoccurrence, nothing more can be done. In the cases of Henry¹ and Hutchinson,² for example, in which, respectively, disarticulation at the shoulder, and excision of one-third of the humerus had been practised for myeloid tumours of that bone, there was reoccurrence in the stump, and in the lungs. So, too, in a case in which Langenbeck³ resected eight inches of the humerus for a tumour, as large as the double fist, which had perforated its capsule and extended processes between the muscular fibres of the flap. On death from exhaustion, ten weeks subsequently, the muscles of the supra and infraspinous fossæ of the scapula were found to be the seat of sarcomatous tubers. In all of these cases, diseased tissue had escaped the action of the knife, and precisely the same thing may happen if a limb be removed in its continuity too close to the morbid growth.

From these considerations I would establish the following general rules for guidance in selecting the point at which amputation should be performed:—

¹ Trans. Path. Soc., Lond., vol. ix. p. 367.

² Ibid., vol. viii. p. 351.

³ Langenbeck's Archiv, vol. i. p. 142, case v., and Gurlt's Jahresbericht für 1860-61, p. 532.

For tumours of the lower epiphyses of the tibia and fibula, just below the knee; when the upper epiphyses of these bones are affected, through the lower third of the thigh; at the junction of the upper and middle thirds of the thigh for disease of the condyles; at the hip-joint for that of the upper extremity of the femur; below the elbow for tumours of the lower epiphyses of the radius and ulna; through the lower third of the arm when the upper epiphysis of the ulna is affected; at the junction of the upper and middle thirds of the arm for disease of the condyles of the humerus; and at the shoulder joint when the head of the humerus is involved.

In the event of the neoplasm being small, for example, not larger than an orange, it will not be necessary to go so high up. For a tumour of that size occupying the lower end of the tibia or fibula, the leg may, with great propriety, be amputated through its middle. On the other hand, a voluminous tumour may require the incisions to be made farther off. Thus, a growth, as large as the head, commencing in the lower extremity of the radius, had best be removed by disarticulation at the elbow.

Instead of amputation, excision of an entire joint, or of the affected epiphysis, along with the shaft, of the more slender long bones may be resorted to, particularly if the tumour presents a uniformly smooth surface, and is of a firm, dense consistence, or is inclosed in an osseous shell. Under these circumstances the surrounding tissues will, most probably, be found to be free from involvement; whereas, if the morbid growth is bossulated, and soft and elastic, or apparently fluctuating, the neighbouring structures will be likely to be implicated, and amputation should be selected. In cases of doubt, excision may be commenced, and removal of the limb be substituted for it, if the capsule of the tumour is discovered to be perforated, and the soft parts infiltrated by the morbid product. If the periosteum of the adjacent bone is firmly adherent to the capsule of the neoplasm, or if the bone is eroded, the latter should also be excised, since, in these conditions, it is liable to be the seat of sarcomatous deposits.

These general statements are illustrated by the following abstracts of all the cases that I have collected of excision of myeloid sarcomas. The subjects in all, except the eighth case, were females, and in four the tumours were voluminous:—

CASE I.¹—Langenbeck excised, antiseptically, seven inches of the ulna, four inches of the humerus, and the head of the radius, on account of a tumour, as large as a man's head, of the upper extremity of the ulna. The end of the humerus was deprived of its cartilage, and its spongy tissue exposed. In the latter was embedded an isolated, soft, dark-red nodule, of the size of a cherry, which was made up of giant, spindle, and round cells. Forty catgut ligatures were required to arrest the hemorrhage. The woman was well two years subsequently, but the arm was of little use.

¹ Case 24 of table.

CASE II.¹—From a female, aged 26 years, Langenbeck removed, antiseptically, nearly four inches of the lower end of the ulna, for a tumour in that situation, of three months' standing, and as large as the fist. High febrile excitement set in, the joint supplicated, and was itself excised on the seventh day. Death, however, ensued under pyæmic symptoms.

CASE III.²—Langenbeck excised three-fourths of the ulna for a tumour, inclosed in a perfect bony capsule, which began in the lower end of that bone. The woman was in perfect health at the expiration of four years.

CASE IV.³—Mr. Lucas removed the lower half of the ulna for a growth which extended two inches and a half above the wrist-joint, the latter of which was left intact, as it was protected by the triangular articular fibrocartilage. Eight months subsequently the woman had free use of her hand, employing it in all her household work, the movements of pronation and supination being perfect.

CASE V.⁴—For a tumour of the lower end of the radius, Mr. Morris excised about four inches of both the radius and ulna, the latter of which was closely attached to the osseous capsule of the growth. The woman was alive eight months afterwards, but the limb had to be supported by a splint, and was practically useless.

CASE VI.⁵—Langenbeck excised, antiseptically, one-half of the fibula, along with a myeloid sarcoma, as large as a child's head, which started in its upper epiphysis. Forty catgut ligatures were applied to the divided vessels, and the woman was well eight months subsequently.

CASES VII. and VIII. are those of Langenbeck and Hutchinson, previously alluded to, in which the upper extremity of the humerus was the seat of the disease. In the former, eight inches of the bone were resected, but death occurred in two months from exhaustion due to profuse suppuration. In the latter, one-third of the bone was excised, along with the acromion and coracoid processes, which, however, were not implicated. The arm was bidding fair to be useful, but death occurred in five months from local and general recurrence.

CASE IX.⁶—In consequence of amputation having been declined, Billroth excised six inches of the lower extremity of the femur. The patient, a girl, 17 years old, died of pyæmia on the twenty-sixth day.

From an operative standpoint, little can be said in favor of excision, except when the lower end of the ulna is involved in a small tumour, and the interarticular cartilage can be preserved, through which the wrist-joint remains unopened. In a case of this description, Mr. Lucas succeeded in giving his patient a useful limb, while in the remaining recoveries the limbs were simply incumbrances. Besides, the mortality after excisions is greater by 3 per cent. than after amputation, notwithstanding the fact that the former was practised on the bones of the upper extremity, except in two instances, while the thigh was the seat of the majority of the amputations.

¹ Langenbeck's Archiv, vol. xxi. supp. p. 331.

² Case 11 of table.

⁴ Case 17 of table.

⁶ Billroth, Chir. Klinik, Wien., 1869-70, p. 367.

³ Case 16 of table.

⁵ Case 25 of table.

Whatever operation be selected, if it be conducted near the seat of the disease, the surgeon should be prepared to encounter considerable hemorrhage. Thus in cases I. and VI. of the excisions, not less than forty ligatures were required, while in the case of Professor Gross (see p. 41) of disarticulation at the shoulder, the loss of blood was so great, despite compression of the subclavian artery, that death ensued in two hours.

ARTICLE II.

THE SUDDEN DEAFNESS OF SYPHILIS, WITH CASES. BY SAMUEL SEXTON, M.D., Surgeon to the New York Ear Dispensary, Aural Surgeon to the New York Eye and Ear Infirmary.

WRITERS on aural affections have long known that invasions of the ear by syphilis were not of uncommon occurrence, and the prevailing opinion has been that the seat of the lesion is usually in the labyrinth. Better knowledge of the disease, however, seems to lead to the conclusion that its chief, if not entire, location is in the middle ear and its conductive mechanism. At the beginning of this century, especially in England and France, there was a sudden increase in otological literature,¹ if it deserves that name, and the references to "constitutional deafness," which included aural affections, having their origin in syphilis, are frequent.

Mr. Saunders,² whose work in 1806 fairly represented the then existing views on this subject, says (page 95, *et seq.*), "The whole class of the diseases to which the internal part of the ear is subject may be denominated nervous deafness," and after describing the distressing and peculiar tinnitus which characterizes "nervous deafness," he goes on to say, "Being forcibly struck with the congruity between deafness produced by syphilis, and the concomitant symptoms of nervous deafness, I could not avoid concluding, that although the remote cause be different, the proximate cause is the same in each," and "When the syphilis is cured, the effect is often irremovable, and the injury to the function of the affected organ permanent. There is a period, therefore, at which syphilitic deafness is irremediable, and this is more remarkably the case with nervous deafness." Saunders having satisfied himself that the proximate cause of syphilis and nervous deafness was the same, determined to try the success of an analogous treatment in a recent case of "nervous deafness." The patient selected was J. Waiton, who applied to Mr. Saunders at the Dispensary for

¹ Vide Works of Saunders, London, 1806 : Curtis, London, 1819 : Wright, London, 1829 : Caswell, London, 1833, and Itard, Paris, 1821 ; Deleau, Paris, 1822 ; Saissy, Paris, 1827, etc. etc.

² Treatise on the Ear, first American edition, Phila. 1821.

relief. "He had been extremely deaf for two months. The meatus contained little wax, and he could inflate the tympanum. He complained of noises in the head, such as I have described above. His deafness was so great that I could scarcely make him hear what I said. He was a robust man, and plethoric. I put him on a most rigid diet, and gave active cathartics three times a week. For the first fortnight the doses were calomel gr. viii at night, and natron vitriolat. 3iss in the morning. Blisters were also applied behind the ears three times successively at intervals of a week. He continued on this plan for six weeks, the cathartics being regulated according to circumstances. His hearing was now restored, but slight noises still remained. He was much reduced, and I gave him small doses of calomel every night, and sarsaparilla twice a day for a fortnight. The noises had now left him, he was put on his usual diet, and took cinchona. At the end of ten weeks he was perfectly well."

Mr. Saunders reports other cases in which in his own hands the above treatment was successful, but he fails to inform the reader if any of them had syphilis, an unimportant fact surely with the accepted nomenclature of that day. Mr. Saunders regarded the immediate cause of the deafness to be the deposition of lymph, and in the incipient state he proposed to attack the disease by a "strict antiphlogistic treatment," and the resort to means for promoting absorption. This was the period which immediately preceded the day of Joseph Toynbee, when the foundation was laid for a more exact pathology.

The English aurists¹ of the period subsequent to those above mentioned almost entirely omitted syphilitic affections of the ear from their writings, as did also the continental writers, unless, indeed, an exception be made of the researches of Frank and Linke, who, however, confined themselves mostly to the description of external syphilitic lesions.

It remained for Sir William Wilde to more nearly approach a solution of the syphilitic affections of the tympanum which this paper is intended to describe than had any one else previously. Although Wilde treats of the subject under the head of *syphilitic myringitis*, he evidently describes the disease as it affected the tympanum and its conductive mechanism. He says :—²

"Although practitioners who treat syphilitic diseases upon a large scale appear to be aware of the fact that venereal occasionally causes deafness, I cannot find any authority which has noticed the disease I am about to describe. The deafness which sometimes accompanies the secondary form of syphilis is generally believed to be caused by inflammation, and ulceration extending from the throat through the Eustachian trumpet into the middle ear; such may, under certain circumstances, no doubt, occur, and produce destructive inflammation and suppuration in this cavity, although I have never seen such a case myself, nor have I met with a well authenticated instance of it recorded. . . . The disease which I am

¹ Pilcher, Dufton, Harvey, Toynbee, Yearsley, etc.

² Practical Observations on Aural Surgery, by William R. Wilde, Phila. 1853, pp. 252, et seq.

about to describe is an inflammation of a specific character, occurring in the membranes of the tympanal cavity, but chiefly exhibited in the external membrane of the drum. All the cases I have seen of this affection occurred in young men, and generally those of fair complexions and blue eyes, who had had primary sores upon the genitals from six to twelve months previously, which sores were of rather a deceptive character, so that mercury was seldom given in the first instances, at least in a legitimate form."

In these cases there were generally well marked secondary affections, and—

"In almost every case which I have witnessed, the *disease appeared suddenly*, as an eruption was fading off: in two, it came on at a later period, and was accompanied by a loss of hair; in most it appeared in the upper or middle ranks of life. In most cases there is at first a sensation of fulness in the head, and often vertigo upon stooping or rising up suddenly, and the patients have usually a feeling of fulness within the ear; but in no instance have I seen it accompanied by acute pain, in which circumstances it resembles the subacute form of inflammation already described, and is therefore placed as a subdivision of that species: but upon inspection, the amount of redness and vascularity will be found very much greater than the latter; both ears are usually attacked at the same time."

"The amount of deafness is always very great, and is the symptom that first attracts the patient's attention, and it seldom varies. Tinnitus is not usually present, but in two cases which I possess the notes of, the deafness was ushered in by a very loud noise, which passes away after a few days. This inflammation does not end in a muco-purulent discharge from the tympanum, the surface of the membrana tympani, or the sides of the auditory canal.¹ . . . Two of the worst cases of non-congenital deafness I ever saw appeared to have been the result of syphilitic inflammation, and in both there was great thickening, opacity, and insensibility of the membrane. I am also inclined to think that syphilis has played a more extensive part in the production of deafness than the profession is aware of."

It will be observed that Wilde regarded the disease as an affection of the membrana tympani only, but his description comes very near reaching the disease as it is now believed to exist in the middle ear. That he did not find tinnitus in all of his cases may be accounted for by supposing that in some instances an error in diagnosis was made. Wilde reports several cases that were cured with mercury pushed to salivation.

Writers, since the time of Wilde, have not added much to his pathology of this subject; the majority of them, in fact, have sought for an explanation of some of the prominent symptoms of the disease by locating the lesions in the labyrinth. Schwartze,² who has written exhaustively on aural pathology, omits any account of special syphilitic lesions, although he includes in his work croupous and diphtheritic inflammations. Schwartze's researches, however, throw us into a state of doubt as to our knowledge of the pathological physiology of the labyrinth when he informs us that so little is known regarding its pathological histology. He says:—³

¹ The italics are ours.

² The Pathological Anatomy of the Ear. Schwartze. Translated by J. Orne Green. Boston, 1878.

³ Loc. cit.

"The pathological histology of the labyrinth of the ear is still in the first stages of its development, and needs the services of an extraordinary anatomist, who must work deeply and thoroughly in this most difficult field for years to bring forth any result. What has been done by some in this field, of late years, with the most earnest endeavors, is scarcely more than a sad dillitanteism, and has no value for science."

A step forward has certainly been taken in removing from the list of nervous affections of the labyrinth diseases whose symptoms now clearly establish their identity with anomalies of the conductive apparatus of the middle ear. Of the primary and secondary diseases of the acoustic nerve, or of the labyrinth and its bony case, we know but little, and can, therefore, place but little value on observations made with the belief that such knowledge exists. "Even in the most acute inflammations of the tympanum, a simultaneous hyperæmia of the labyrinth is met with only exceptionally," "and the existence of an independent and primary non-traumatic inflammation of the membranous labyrinth has not yet been demonstrated anatomically with certainty."¹ And it may be added that the temporal bone is not regarded as a favorite seat of such syphilitic affections as exostosis and the like.

The attacks of syphilis described by Wilde have many symptoms which also characterize sub-acute (non-purulent) mucous catarrhal inflammation of the middle ear, and I believe the specific character is frequently engrafted upon the catarrh. The ordinary catarrhal inflammation, however, is never attended by pathological conditions of the middle ear, causing the sudden and absolute deafness which attends on syphilis. The frequency of this affection is, I am sure, much greater than generally supposed, the greater number of such cases having been, in my own former experience, placed under the head of labyrinthian diseases.² When we consider that scarcely any part of the body escapes the ravages of syphilis, it is no matter of surprise that the ear is frequently invaded; in fact, an ear highly hyperæmic from any cause would seem to invite the disease to a region extensively supplied with a mucous membrane, and not without connective tissue, both of which structures are obnoxious to syphilis. The middle ear is probably but seldom invaded by syphilis *per* the Eustachian tube by extension from the mouth, throat, etc., the attack more frequently having its origin in the ear itself. The following cases are selected from my notebooks as examples of this disease.

CASE I.—A German, aged 42, salesman, first seen by me December 29, 1877. On May 8, 1877, he became an inmate of St. Francis Hospital, from the records of which I learn that he gave a history of syphilis extending back two years before his admission. He had long been intem-

¹ Loc. cit., page 157.

² Nottingham relates a case, but is unable to decide whether the disease should be located in the middle ear or in the labyrinth. In this case a mercurial course, and another of iodide of potassium, did no good. Diseases of the Ear. Nottingham. London, 1858.

perate, and was much run down. Three months before his admission, he was weak and dizzy and staggering from side to side when walking, and he suffered from occipital headache, which gradually extended over the whole head. He had Bell's paralysis on left side of face. On admission the pain in head was intense, the paralysis of face still existed, and he was very anaemic and feverish. The prominent symptom now observed was hemianopia, first in left side of head, later in right side; finally both sides were the seat of intense suffering. Potassium iodide was given him in doses as high as 80 grains daily, with no relief. Bromide of potassium was substituted and afforded some relief. The paralysis now existed on both sides.

August 1. Headache has been a little relieved, but deafness became a feature in both ears, and afterwards tinnitus, "like the wind in motion," was experienced, it being greatest in the left ear. No loss of sensibility or muscular contraction; soft palate drawn to left side; motor paralysis of right side of face diminished. Cannot hear shouting.

September 5. Discharged. During the last two months of his stay, he took biniodide of mercury and iodide of potassium. A brain tumour was supposed to be the cause of these symptoms. He now came to the New York Ear Dispensary (December 29, 1877), and an examination showed the right membrane to be very dull, somewhat congested at the anterior superior quadrant, and along the malleus plexus. It was greatly retracted. The left membrane was similar to the right, but there was a faint cone of light.

A vibrating tuning fork placed on teeth heard best in right ear; on vertex and glabella not heard. It is heard when held near either ear, and when on left mastoid. Vision at no time affected. His appetite is now good, but he has a dull, heavy look, and cannot close the left eye. He speaks as though his mouth was full of some fluid—the uvula drawn to right side. Eustachian tubes are open. His general health is fair, although there is yet much unsteadiness in his gait, for which he requires the use of a cane. When standing with closed eyes he feels "trembly," and if he attempts to walk he staggers, and has to exert himself to keep from falling. He was placed on biniodide of mercury $\frac{1}{25}$ gr. three times per diem.

January 9, 1878. Much better; walks without cane. When trying valsalva, cannot keep lips closed without holding them with his fingers. Perforated right membrane to-day in its anterior segment; no fluid in drum; but air passed readily on valsalva. There was no change in the hearing. Treatment continued.

February 3. Is getting stronger daily, and has less tinnitus. Fancies he can distinguish very loud noises slightly. Walks much better, and has been engaged at work as a street vender. Vision good. To cease treatment.

18th. Sounds like a drum or a church bell faintly heard. Finds cane only necessary at night. Cannot close his eyelids. There exists no pain. The membrane is clearing, although the anterior superior quadrant is somewhat thickened and injected. The right membrane resembles the left. His hearing for voice is not improved; indeed, he cannot hear any voice, however loud. The patient came no more.

CASE II.—A laborer, aged 21, was first seen by me January 11, 1878. Six months ago had a sore on penis, shortly followed by an eruption on the chest, and then on the legs. In five months after the sore appeared he awoke one morning and discovered that he was very deaf, and in a few

days he could hear nothing. Having been exposed at out-door labour, he believed the deafness to be due to "cold." Three days later he experienced great pain in the occiput, extending down the neck, which was swollen, and so remained three weeks, during which time he was dizzy and unable to walk straight. There was dimness of vision. Simultaneously with the pain referred to, he experienced tinnitus in both ears which was like machinery in motion, sounding bells, etc. The tinnitus now is "like the wind."

Both *meatus*, which were large, contained a thin tenacious coating, which was dark in colour from the presence of dirt and cerumen, and remained attached to the integument of the *meatus* after syringing. The tympanic membranes were not well seen on account of the presence of this closely adherent substance on their external surface. The right membrane was dull, lustreless, of a pale white colour, and moderately retracted. The left membrane has a similar appearance, but is greatly retracted, and the irregular depressions create a suspicion that adhesions or agglutinations threaten.

Words shouted through a trumpet into left ear are unheard, but he fancies he can hear some sounds when the experiment is made in the right ear. A vibrating tuning-fork is heard when placed in the cranial bones. He has some slight throat trouble, and the Eustachian tubes are open. Rarefaction of air in both *meatus* enables him to hear some few words through a speaking tube. He was put upon an active, mercurial course.

16th. Has a severe cough, and pain in the forehead, and when walking he is dizzy and staggers like a drunken man. If the eyes are closed, the staggering from side to side is greater, and the experiment increases the headache and dizziness.

19th. The left membrane is less retracted, and compression of air in the *meatus* improved the hearing on that side so much that he could hear a sentence loudly spoken through trumpet.

30th. Dizziness continues to exist, also the frontal headache, which sometimes extends to one side of the head. There is much tinnitus in the left ear.

Feb. 2. Patient seems to be improving, and there is less tinnitus. The membranes are gently moved inward and outward by condensation and rarefaction of the air in the *meatus*. Medicine is still continued.

9th. There is scarcely any tinnitus in the right ear, and in the left ear it is greatly lessened. He hears the vibrations of a small bell which is damped by being held in the hand while it is ringing, twenty inches from right ear and one inch from the left. His general health is improving, although he has some sweating at nights. The doses of the medicine are lessened one-third.

13th. The left membrane is retracted at the anterior superior quadrant, and lies so closely to the posterior wall of the tympanum that the point of adhesion resembles a perforation. The tough substance in both ears has been softened by dropping in water containing twenty per cent. of glycerine, and syringing to-day removed the most of it. It has but little resemblance to cerumen. The right membrane can be seen to be clearing up, the left is very dull, especially the anterior segment. His hearing is a little better.

23d. The posterior segment of the left membrane is adherent, and the short process protrudes prominently, but the handle is not well outlined. Rarefaction by syringe does not remove the membrane from its position

on the posterior tympanic wall, even when force sufficient to occasion slight bleeding is used. The whole membrane is gradually becoming adherent, but no active inflammation is apparent.

March 2. The right membrane is still clearing, and the left has become less adherent since last operation. There is free admission of air to both drums, which the patient is requested to renew by the occasional practice of Valsalva's experiment. There is less tinnitus and better hearing for bells, etc., in right ear.

9th. Left membrane is very irregularly retracted, and at anterior superior quadrant there is a hyperæmic condition. Patient now experiences very little dizziness. In both ears he has tinnitus.

23d. The right membrane is clear anteriorly, but about short process and extending down malleus handle there is a more less hyperæmic condition. In the left ear there is less tinnitus and better hearing.

April 20. Right membrane but slightly retracted and almost clear, except a small portion of the posterior segment, and there is a distinct cone of light. The left membrane is clearing also, but it is much sunken in places. He hears tuning-fork as before, and the Eustachian tubes are free. His hearing altogether is about the same that it has been for some time, *i. e.*, he cannot hear any words distinctly, however loudly shouted through a trumpet. There is no injurious effect of mercury observable. Patient did not again return. The temporary increase of the acuity of hearing by rarefaction and condensation is noticeable in this case.

CASE III.—Patient about three-fourths African, age 30. She first came under my observation at the New York Eye and Ear Infirmary on August 29, 1878. She stated that she had been deaf for seven months, and she thought it originated from a cold. On examination she is found to be absolutely deaf to all external vocal sounds, and is not aware of being able to hear anything. The deafness came on by degrees in a rather brief period of time. Before she was entirely deaf the rattling of dishes, when washed, sounded painfully loud, as though they were being broken. She describes the tinnitus at the commencement of the attack as resembling the humming of bees, but at the present time there is a roaring, which seems to "jar" her. She sleeps badly, one cause of which is, besides her general anaemic state, the alarm occasioned by the noises heard in her head. The symptoms of syphilis are, that some six months ago she had an eruption, sore throat, and falling of the hair, together with rheumatism. There are now glandular swellings on the neck below the mastoids and on the back of the neck. There are also some old cicatrices on the neck. A vibrating tuning-fork is heard when placed on the teeth.

The right tympanic membrane has a thickened appearance, and is moderately dull, a faint cone of light only being observed. The plane of the membrane is about normal. The left membrane presented about the same appearances.

The *meatus* are at their entrance large and oval, but towards the membrane their calibre is smaller and slightly denuded of epidermis. She is subject to occasional attacks of dizziness, and when she attempts to stand with closed eyes and feet placed together she falls backwards, nor can she walk with her eyes shut without a similar result. She describes a sensation, experienced sometimes when walking, as though she were being lifted up by springs underneath her feet. For the most part she hears her own voice when talking, but sometimes it suddenly becomes inaudible, or partially so, and then she is unable to regulate the pitch. At such times she

unexpectedly elevates or lowers her voice, regulating it by its sound as heard by herself, a proceeding that embarrasses her very much, and also astonishes her auditor.

To-day while undergoing examination she could not hear herself scream. Later, when hearing better, she is requested to utter the letters of the alphabet, and she hears A best of all, and U and W pretty well. Consonants are not so well heard. While the examination is proceeding there is an exacerbation of the noises in her "ears and head" (probably from the excitement), and she cannot distinguish her own voice when talking.

To ascertain whether the drums contained any fluid I decided to make a perforation in one of the drum membranes, which operation was accomplished by pushing a chisel-shaped myringotome through the posterior segment of the left. No fluid was present in the tympanum opened, and I did not operate on the right side.

Sept. 2. The perforation made in the left membrane has healed, and the only result which immediately followed the operation was an increase of the noises heard for a short period of time. She is to take potas. iod. gr. iv every four hours.

5th. She is less dizzy, and can stand better with her eyes closed and feet together than before. She can hear her own voice most of the time, and it sounds "distant." Hears vibrating tuning-fork on chin and in left ear when placed on left mastoid. There is some tenderness in ears, which may be the result of so much handling.

April 9, 1879. The patient, not having been much encouraged as to the prognosis of her case as regarded her hearing, placed herself under the care of a gentleman connected with a charitable institution, and he, having also diagnosed syphilis ("cerebral syphilis"), gave her iodide of potassium in large doses. "During the treatment," he says, "she had several epileptiform seizures, some of them accompanied by eclampsia, others appeared to be '*petit mal*.'" He thought she was improved by treatment. The patient, who came to me again to-day, says she was in the institution referred to above for about four months, that while there under treatment she was weak, restless, and nervous. Some glands beneath right ear suppurred twice, etc. An examination to-day of the right membrane shows that its mucous coat is hyperæmic, as well as the border of the external layer where it joins the integument of the meatus externus. There is slight retraction of the membrane, and the cone of light is fairly well marked. The left membrane does not differ much from the above. She now experiences buzzing and roaring noises in her ears, with occasional sounds like the discharge of guns. Usually she hears her own voice in its natural tone, but it is, however, subject to changes to "hoarse or distant." She hears herself sing but not whistle. The vibrating tuning-fork is heard on teeth and mastoids but not on vertex. She is absolutely deaf as to the voice of others, but has learned to comprehend remarkably well by reading the lips. She can hear my voice when I speak through the mouth trumpet with its small end placed far back in her mouth, but cannot understand anything said.

CASE IV.—An Englishman, aged 21, consulted me September 14, 1878. His hearing was always good until two years ago (1876) when he was taken violently ill, and had vomiting and dizziness, with sudden and absolute deafness in his left ear, which he describes as coming on like a pistol shot, but without the presence of other noises. Immediately preceding this attack he was operated on for some affection of the eyes. At that

time iodide^{*} of potassium was administered. This was in London, and shortly afterwards he returned to America. During the past summer (1878) he was in poor health, and on the night of July 21, he became dizzy after going to bed, and experienced a cracking noise in both ears; (perhaps both ears were invaded alike). In the morning he awoke with retching, and found that he was absolutely deaf in the right ear as well as in the left. He has experienced a great many indescribable noises in both ears ever since. At the present time the noises in the right ear are like the singing of a "Virginia mocking bird" and the ringing of bells. He is now anaemic and much run down, and requires the presence of an attendant when on the street. He has a great deal of vertigo, objects seeming to go around and up and down. If he stands with his feet together and closes his eyes, he at once falls to the right, and on attempting to walk he staggers about like a very drunken man. Since his disease began, over two years ago, he has suffered greatly from frontal headaches, the pain extending to the vertex. Of late these attacks are more severe. His tongue is clean, the pulse 80 and regular. His mother and an aunt are very deaf, and an uncle died of consumption. He himself seems to be a subject for catarrhal inflammation. For some years as he states, he has been subject to seminal emissions which have given him considerable concern. Although he does not admit having had syphilis, he has had attacks of sore throat, and is not at all frank in his manner when questioned on this point.

The *meatus* now contain a tenacious substance, which is light coloured, and is intermixed with some cerumen, preventing a view of the membranes. Most of it being removed by syringing, the right membrane was found to be coated by an ashy-white humid exudation, and the left membrane was white in colour and lustreless, the malleus handle being quite red. The patient informs me that formerly his face was highly flushed much of the time. The skin of the auricles and mastoids is hyperæmic. With the second dentition he had much toothache, and now he has just cut the two upper wisdom teeth, their direction being rather outward. The inferior wisdom teeth have yet to appear. He has one carious tooth which is ragged, and his throat is slightly catarrhal.

He hears his own voice distinctly, the distinctness, however, frequently varying for a few moments at a time, which the observer can detect as he elevates or depresses his voice to correspond with his own estimate of its proper pitch.

He hears absolutely no outside voice in the left ear, but in the right ear he can hear sound when I strike the metal bougie on a tuning-fork held close to the ear. The vibrating tuning fork is heard on either mastoid, and on the teeth. When the external *meatus* are closed by pressing the tragus against the *meatus* by the fingers, the voice of the patient and the tuning fork on the cranial bones are heard more loudly. His voice to himself sounds like a voice coming from down in a well. When he screams or speaks very loudly, the sounds have to him a metallic quality like striking together two pieces of metal, and my own voice carried to his ears by trumpet has same character. His ordinary voice heard through conduction of tissues from his vocal chords to his ears is muffled. Very low tones of little intensity uttered close to his ears are very painful. He is given hydrobromic acid.

21st. The left membrane is observed to be greatly retracted, and there is a state of hyperæmia at its anterior superior quadrant extending on to

the meatus externus ; the inner extremity of the latter is also narrowed by its swollen integument, and it is tender.

Looking into the right ear, it is found that the inner extremity of the meatus is hyperæmic, and disposed to bleed when touched by the speculum, the membrane still coated by a sort of exudation which has been softened by the application of a weak solution of glycerine in water. After its removal by syringing it is found to be a good sized mass, which looks like exfoliated epidermis. The membrane is now free to inspection.

Patient has better general health but the cough is still harassing; the dizziness is less. The patient's condition now being favourable, I decided to begin with one-fiftieth of a grain of the red iodide of mercury, to be taken three times a day shortly after eating. The hydrobromic acid which had a good effect now to be used only when required.

23d. Patient fancies he can hear the singing of a canary bird more distinctly, as well as the sounds of ringing bells, rattling of dishes, and the voices of children, etc. Of these fancied improvements I entertain some doubt, as the patient is hopeful of cure, and does not doubt for a moment that he will ultimately recover his hearing. If the gravity of his disease were fully realized, it was believed by myself and his friends that he would commit suicide.

To-day I examine his hearing power by the highest and lowest tones of my own voice. Both are to him painfully high in pitch, as he himself states it, "so high that he cannot hear it." Bells have a cracked sound, and there is a vibratory, metallic quality to all sounds heard. When I speak to him through a mouth trumpet—a tube of two and a half centimetres in diameter, fitted with suitable tips of vulcanite, and when in use extending from observer's mouth into that of the patient—he hears my speech of both high and low tone, but it all seems to him "low and rumbling, or gruff." The tinnitus in left ear is constant; in the right ear it is variable. The condition of the membrane is about the same.

30th. Patient still complains of "weakness of the knees and ankles," but his cough is better. He says he heard voices in the horse-ear this morning, and he hears a vibrating tuning-fork held near the right ear. Treatment continued.

Oct. 5. Patient gains in strength. Dr. A. H. Buck, who now saw the patient, agreed with me that the mercury should be pushed, and he was accordingly given—R. Hydg. bichlor., gr. j; Potas. iod. $\frac{5}{3}$ ss; Syr. sarsaparilla co., $\frac{5}{3}$ iv. M. A teaspoonful three times a day, together with mercurial inunctions.

7th. The inunctions continued, but the mixture stopped, and tablets containing one-fiftieth of a grain of iodide of mercury resumed.

12th. Treatment continued, although the stomach is slightly disturbed by colic, and he experiences some sweating of nights. In both ears there is a feeling like the presence of fluids, and he has some vertigo.

15th. The noises are observed to increase by exercise; they are like "blood sent to the head." Patient's general health improving, and he hears more sounds from without, but they seem abnormally high in pitch. On piano all the notes are heard up to middle C; after that he only distinguishes a rumbling sound. He has ascertained that he can tell whether he is singing high or low. When I speak loudly in his ears, it is heard as high, and a hissing noise sounds like whistling. The experiments, when repeated through the mouth trumpet, seem to be heard normally. All the sounds heard through mouth are distinguished, he believes, by the

right ear. In the left ear the loudest sounds feel like "something being poked into the ear," and not as sound usually is heard. There is tinnitus at times like cracking, and when he is quiet whistling is heard. Patient frequently speaks of hearing a rushing of blood. His general health is improving.

24th-28th. The mercurials were pushed more actively.

Nov. 21. The treatment was uninterruptedly maintained until the present, when the patient is compelled to cut short his stay in New York. There was no decidedly constitutional effect from the medicine. His hearing was only slightly modified during his treatment, and when he left he could hear no conversation, even through a trumpet. His general health, however, was greatly improved.

It should be stated that in none of these four cases were the throat symptoms very prominent, nor were the Eustachian tubes found to be obstructed in any of them. In fact, from all that I can glean from the literature of this subject, and from my own observations, I incline strongly to the opinion that syphilitic lesions seldom, if ever, reach the middle ear by continuity of tissue from the throat.

That these cases were syphilitic, I feel quite sure; for, besides the history of the cases, we know of no cause which produces such peculiar and decided symptoms of deafness. For some of the recent literature bearing on the history of such cases, we need go no further than the authors of America.¹

These affections are seldom suppurative, although in all of my cases there was a history of considerable hyperæmia of the middle ear, which also showed itself in the integument of the external auditory canal. There is a point of interest in these cases to which, as far as I know, attention has not yet been drawn by writers on this subject. I allude to the pre-existing state of hyperæmia in the drums, either from cold or from a sympathetic irritation associated with some affection of the mouth or throat, thus inviting, as it were, an invasion of the drum by the specific affection, an example of which is seen in Case IV., where there was not only a decided catarrhal habit, but the irruption of the wisdom teeth is super-added. As regards the behaviour of syphilitic inflammation in a closed cavity like the tympanum, we know that the result is most destructive to normal hearing, although not suppurative, and that the destructive process probably consists in an exudation, or the deposition of new plastic material, that interferes with the normal functions of the conductive apparatus. The retraction of the membrane seems to depend on causes other than the absence of free Eustachian tubes.

There would appear to be a contraction of the mucous lining of the drum,

¹ Those interested in the literature of this subject can consult a paper by Dr. Knapp, entitled "A Clinical Analysis of the Inflammatory Affections of the Inner Ear," Archives of Oph. and Otology, vol. ii. 1871; Dr. Roosa's "Treatise on the Ear," 4th edition, page 485; Burnett's "Treatise on the Ear," 1877, page 568; Dr. Albert H. Buck, "Syphilitic Diseases of the Ear," American Journal of Otology, January, 1879.

the membrane under these circumstances having a wrinkled appearance. The labyrinth in these cases seems not to be greatly involved, for the auditory nerve responds fully to the sounds conveyed to it, whether from the patient's own vocal chords, etc., or the vibrating tuning-fork placed on the skull. That the immobility of the membrana tympani and the pathological condition of the chain of ossicles (separating the malleo-incudal or stapedo-incudal joints, or fixation of the stapes in the oval window) are sufficient to account for all the phenomena of audition as described in the four cases above cited, I have no doubt. The slight changes in this apparatus, capable of deranging audition, may be better appreciated when it is remembered that the range of the excursions occasioned by sound waves is from 16 to 45,000 per second. The attention of the reader is drawn to the progressive changes in the appearance of the membrane observable in some of the cases above reported. The deafness in these cases is not always sudden, nor do both ears always become affected simultaneously, although I am inclined to believe this is the rule. My own explanation of these anomalies has been attempted elsewhere.¹

That the labyrinth or any portion thereof, as the cochlea, may fail in the performance of its functions may be sometimes the case, but in the class of which those cited in this paper are examples, the writer considers such an explanation as improbable.

There is one striking phenomenon observed in nearly all the cases I have seen, namely, the high pitch, if I may so designate the condition, of all sounds heard under certain conditions. I have observed this symptom in acute inflammations of the middle ear, and I believe it must have often been noted by other otologists, but perhaps described by them as relating to "false" or "double" hearing. The latter, however, is simply a condition of autophony, while the "high pitch" of sounds heard seems to depend on some physical anomaly of the conductive apparatus not yet ascertained. Patients have informed me that the heavy concussions of a loaded truck passing over the pavement, or the rumbling of the elevated railway trains in motion, produce a painfully high-pitched sound, like a whistle. One can imagine that owing to the abnormal state of the conductive apparatus some sounds can make no other impact on the drum-head than is normally produced by the sound of whistling. What such a condition is we must leave for the physicists to determine.

This syphilitic affection of the ears has not been found to be a painful one, although the noises heard in the ears by the patients, together with the autophony usually present, render it very distressing. Most frequently patients designate these phenomena as "pain" or as "something throbbing or pulsating in the ear," etc., and a close examination is necessary in order to reach a differential diagnosis as regards the pain and the noise.

¹ Vide "The Relations of the Conducting Mechanism of the Ear to Abnormal Hearing," Transactions of the American Otological Society, 1878.

As for the treatment, it must be confessed that the results so far obtained do not warrant a favourable prognosis. Should a case present itself when the aural attack was in its inception, the plan proposed by Wilde, and later by Roosa, to follow out the course of syphilitic affections under such circumstances, *i. e.*, attack such special manifestations of the disease with decided antisyphilitic medicines, might be attended with a greater degree of success, but inasmuch as the lesion is not ushered in with pain in the ears, the critical time when such treatment would be serviceable is usually lost before the aurist is consulted.

Conclusions.—1. Syphilitic affections of the ear inducing sudden deafness are of exceptional occurrence, and—

2. They would seem to be induced by a pre-existing hyperæmia in the ears, excited by sympathetic relationship or by an intercurrent attack of aural mucous catarrh.

3. The attacks are characterized by their sudden occurrence, and both ears are usually affected simultaneously, although the contrary sometimes takes place.

4. The deafness is always very great.

5. This syphilitic affection speedily causes a disarrangement of the integrity of the chain of ossicles, most likely at the malleo-incudal joint, probably in some instances at the stapedo-incudal joint, or both of these. The movements of the stapes in the oral window are also likely to be interfered with. The two first-mentioned conditions serve to explain the noises in the ears, and the autophony; the last-mentioned condition would increase the anomalies of hearing.

6. The affection does not depend, so far as we know, on anomalies of any portion of the labyrinth, although the latter of course is liable to invasions from syphilis with the nature of which we are as yet unfamiliar.

7. The disease is usually unattended by pain in the ears, it is non-purulent, and its incurability is a characteristic.

Addendum.—Before leaving the subject of syphilitic affections of the ear, it may not be out of place to allude to a remote cause of deafness which may arise from syphilitic inflammation of the throat, whereby the soft palate has become adherent to the posterior and lateral walls of the pharynx. In five of such cases which have come under my observation there was found to exist a mechanical obstruction of the pharyngeal mouths of the Eustachian tubes which was the cause of the deafness.

ARTICLE III.

ON SO-CALLED HERNIA OF THE TRACHEA, WITH A CASE OF INCOMPLETE INTERNAL FISTULA OF THE TRACHEA (OR LARYNX), ACCCOMPANIED BY THE DEVELOPMENT OF AIR SACS. By STUART ELDRIDGE, M.D., late Lecturer on Anatomy in the Medical Department of Georgetown University; Surgeon of the General Hospital of Yokohama, Japan.

FROM time to time cases of a rare disease have been reported under the various titles of Pneumatocele, Aerial Goitre, Aerial Bronchocele, Tracheocele, and Hernia of the Trachea. Having recently met with an interesting example of this unusual lesion, I believe it to be worthy of record.

Gustave Schneider, German, sailor, aged 26 years, came under my professional care as follows: During the night of July 11, 1878, I was called to the police station to see a case suspected by the officers to be one of foul play. I found a robust sailor in a state of insensibility, darkly cyanotic, and breathing with the utmost difficulty; both inspiration and expiration being accompanied by a loud grunting whistle. The patient had been brought to the station in a jinrikisha (a small vehicle drawn by a man), in which he had taken passage fifteen minutes before, apparently well, though slightly intoxicated. The coolie drawing the carriage noticing that something was wrong with his fare, examined him, found him insensible, and at once took him to the police station. The character of the respiration indicated laryngeal obstruction, and examination by the finger failing to reveal the presence of any foreign body, in the absence of proper instruments for examination and tracheotomy, and considering the suddenness of the attack, the cold douche was applied to the head and neck, which gave speedy relief to the urgent dyspnœa, and the patient was soon able to give an account of himself, although some difficulty in breathing persisted. My colleague, Dr. A. Goertz, coming in at this moment, called my attention to an apparently goitrous tumour upon the front of the neck.

The patient was somewhat inebriated, but able to give a clear description of all that had taken place prior to his seizure in the jinrikisha. As soon as possible the sufferer was removed to the General Hospital, where, as he gave a history of sudden attacks of dyspnœa on several previous occasions, while the circumstances of the paroxysms which had just occurred, the relief of which was followed by a perceptible diminution in the size of the cervical tumour, seemed to point to an element of congestion in its etiology, dry cups over the tumour were ordered, together with chloral and potassium bromide.

A severe attack of dyspnœa came on about two hours after the arrival of the patient at the hospital, which, however, was quickly relieved by dry cups and cold affusion.

Examination July 12, 1878.—The history given is as follows: In December, 1877, patient found that his breathing was occasionally slightly noisy and difficult, and that at such times the front of his neck, on either side of the trachea, seemed to swell a little. The difficulty of breathing and the size of the swellings gradually increased until the end of January, 1878, when he had a severe suffocative attack of dyspnœa, after severe exertion in going aloft rapidly. After this time both dyspnœa and tume-

faction, hitherto paroxysmal, became constant, though only occasionally very great. On the whole, however, since January the swelling of the neck has steadily increased, and the attacks of severe dyspnea have become more frequent. Asserts that in coughing, or when the difficulty of respiration is greater than common, the tumours of the neck become much larger; further, by attempting forced expiration, with the mouth and nose closed, he is able to increase the swelling at will. He is at present a sailor, but has worked on a farm and as attendant in a beer saloon; has often used violent exertion both as a gymnast and at ordinary labour: has no knowledge of the occurrence of any similar affection in any member of his family.

The patient is a large, well-nourished man, bullet-headed and thick-necked. Superficial examination detects nothing abnormal in any portion of the body, save the tumour in the thyroidean region above alluded to. Breathing hurried and noisy, with the usual characteristics of partial laryngeal stenosis. Upon either side of the lower larynx and upper trachea, in the situation usually occupied by the lobes of an hypertrophied gland, lie soft flattened tumours measuring each, vertically, about 6 centimetres in diameter, and horizontally about 8 centimetres in diameter. Palpation indicates a thickness of about 1.5 centimetre. The tumours are not very distinct to the eye, although the front of the neck looks abnormally full. The thyroidean isthmus is thicker than usual, and seems to lose itself on either side in the flattened tumours above described, of which the anterior walls seem to be formed, at least in part, by the thinned and expanded glandular lobes. The tumours appear to be covered by skin and fascia only, and to overlie the cervical muscles. On attempted expiration with the mouth and nose closed, the tumours more than double in thickness, standing out independently, without connecting enlargement across the front of the trachea or larynx. The increase in the size of the tumours, although chiefly in thickness, amounts to about one centimetre in both diameters, as well. On free expiration the tumours immediately subside to their ordinary dimensions. Percussion and auscultation of the region involved, while no artificial obstruction is offered to the free passage of the air, give but negative results beyond the sound produced by the slight degree of laryngeal obstruction which is constantly present. Even during the enlargement of the tumours, caused as above described, there is no tympanitic resonance, nor are there any abnormal sounds under auscultation. The sensation conveyed to the fingers when the tumours are at their greatest size is exactly that of a cystic enlargement of the thyroid, though no fluctuation can be detected. Measurement of the neck under ordinary circumstances, 40.5 centimetres; during the performance of forced but obstructed expiration, 49 centimetres. Deep pressure, close to the cricoid cartilage on either side, during attempted expiration, while it does not entirely prevent the enlargement of the corresponding tumour, it causes it to increase its dimensions far more slowly, and, *vice versa*, upon the air pressure within the trachea being removed, to diminish in size less rapidly. Very firm pressure in this situation is impossible, as it brings on laryngeal spasm.

The voice is somewhat hoarse and low, and, although the laryngoscope fails to detect any abnormality in the structure of the parts, sluggish action of the laryngeal muscles is evident. It should be mentioned that during the severe attacks of dyspnoea the inflation of the tumours was far more extensive than when induced by the voluntary action of the patient. On

one occasion when, owing to spasm, the tumours were tensely distended, the needle of a hypodermic syringe, plunged into the most prominent portion of the tumour upon the left side, gave exit to a stream of air forcible enough to extinguish a lighted match.

Tracheotomy was undoubtedly indicated, but as the patient declined the operation, and, during his stay in the hospital there was no attack of dyspnoea so severe as to demand surgical interference for the preservation of life, the operation was not performed. Inunctions of ungt. iodinii and hydrarg. oleat. were made over the tumours, and with some apparent benefit, as the thickening of tissue became less, and the paroxysms of dyspnoea were less frequent and severe, during the time of stay in hospital averaging about one per week.

Schneider remained under observation until Oct. 24, 1878, when, by order of his consul, he was sent home, still refusing the operation of tracheotomy, which would probably have insured him against sudden danger. The worst attack of dyspnoea which occurred during the latter part of his stay in the hospital, took place after he had been out on leave and had indulged in a small amount of liquor.

With the very limited facilities for reference at my disposal in this out-of-the-way corner of the earth, I am unable to undertake anything like a full analysis of the literature of cases such as that above reported. I find, however, no mention of this form of tumour in most of the leading systematic works on surgery, English, French, German, or American. Gross (ed. 1862, vol. ii. p. 441), under the heading of Hernia of Trachea, alludes to protrusions of the lining membrane of the trachea between its rings, causing median or unilateral tumours from the size of a pea to that of a pigeon's egg. Rokitansky (*Pathological Anatomy*, Am. ed., 1855, vol. iii. p. 48) mentions certain sacciform diverticula of the trachea, and is stated by Jones and Sieveking (*Pathological Anatomy*, 1st ed., Lond., p. 395) to ascribe these to hypertrophy and dilation of the muciparous glands. Riegel (*Ziemssen's Cyclopædia*, vol. iv., Am. ed., p. 289) briefly dismisses the subject as follows, limiting it, it will be observed, to congenital occurrence :—

"Congenital bronchocele (so called), partial dilatation or hernia of the trachea, must also be mentioned as a very rare malformation. In reference to this malformation Ammon (*Die angeborenen chirurgischen krankheiten des Menschen*, Berlin, 1842) says: 'There exists a single and a very incompletely described case of congenital bronchocele reported by Gohl; in this instance there was a complication with struma; the increase of the tumour on inspiration and in crying, as well as the unaltered condition of the tumour on expiration without crying, showed the existence of the complication with bronchocele.' "

Further on, in connection with congenital fistula of the neck, he gives a case which, although the report is imperfect, appears to me to have been of the same nature as that quoted by Ammon.

"A child, twelve years old, when in the fifth year of its age, had a tumour form some two inches above the manubrium sterni, and tolerably in the middle line between both sternal portions of the sterno-cleido-mastoid muscle. The tumour had been opened by means of some caustic, which left a small ulcer and a fistula. The probe penetrated about an inch and a quarter upwards, and gave

exit to a stringy, tenacious mass, which contained mucous corpuscles. The first impression was that this was a case of congenital fistula of the neck; a diagnosis, however, which was excluded by inquiry into the history of the case. Apparently a lymphatic gland had undergone suppuration, and the abscess formed had descended and become ruptured lower down. The tract was cut open. It appeared clothed with epithelium, and could be followed as far as the level of the thyro-hyoïd ligament. It was excised, together with the cicatrix of the ulcer. During the union of the wound air bubbles escaped repeatedly, indicating, therefore, a communication with the air passage, so that the case was explained as one of congenital fistula of the neck. (Fischer in Pitha and Billroth's *Handbuch*, Bd. III., 1 Abth. 3 Lief.)"

The most detailed description of the affection, which I have been able to find, are those of Gayet, Devalz, and Faucon. Gayet's case (*Mémoires de la Société des Sciences Médicales de Lyon*, quoted in *Ranking's Abstract*, Am. Rep., vol. xlvi. p. 152) is reported as follows:—

"In October, 1867 (?), a man whose occupation was that of a joiner, came under the care of Dr. Gayet for chronic irido-capsulitis. Whilst he was under treatment, Dr. Gayet noticed by chance that there existed at the lower part of the front of the neck a swelling, which from its nature was remarkable and worthy of attention.

"The patient first noticed that there was a tumour in the neck nine months before; it was then seated in its present locality; was at first very small, and then gradually increased until it presented itself as a marked deformity. Dr. Gayet states, that at the first glance the swelling might have been taken for a median cystic goitre, but a short examination prevented such an opinion from being held for any length of time. The tumour appeared to be influenced, up to a certain point, by the state of tension of the sterno-mastoid muscles, under the inner margins of which it passed. Whilst the muscle was in action, the tumour became prominent, hard, and elongated from below upwards; in relaxation of the muscle, on the other hand, it became soft, and diminished in size. It was also influenced very much by the respiratory movements; it was swollen and distended by violent and prolonged respiration, and during a deep inspiration it seemed to disappear. To the touch the swelling felt very soft, and it was almost entirely reducible, but the finger could still make out under the skin the existence of a sac with moderately thick walls.

"These characters alone, states Dr. Gayet, pointed out the nature of the swelling, and it was, without doubt, one of those formations described by Frank, Bach, and others, under the names of aerial goitre, tracheocele, etc., a tumour formed by a sac, communicating with the trachea by an orifice more or less extensive, and which, according to the state of tension of the respiratory passages, was empty or again distended with air.

"Two questions in cases of this kind naturally present themselves. What parts form the wall of the cyst? At what part of the trachea does the communication exist?

"Dr. Gayet thinks that from the thinness of the walls of the cyst in his case, no part of the thyroid gland could have been involved; there was nothing to authorize the supposition that in puncturing the cyst in the middle line, any other tissues save skin and fascia would have been traversed by the instrument. The isthmus of the thyroid gland was, Dr. Gayet thought, either above or below the pedicle which passed from the swelling to the trachea.

"With regard to the second question, the true position of the communicating orifice was probably below the cricoid cartilage. Dr. Gayet could not feel it, but it was by careful pressure on the sac at this point alone that, after the goitre had been reduced, the appearance of the swelling would for a time be prevented, even with very forcible efforts on the part of the patient.

"In this case, as in all others previously observed, the tumour was not sonorous on percussion, and no special bruit could be heard by the stethoscope.

"Nothing was learnt from this case that could throw any light upon the mode of origin of such formations.

"Three statements on this point have been put forward, but they have been derived more from hypothesis than from observation.

"1. Laceration of the mucous membrane, followed by quick expulsion of air into the cellular tissue of the neck. This would produce emphysema rather than a true tracheocele.

"2. Laceration of the mucous membrane, followed only by a succession of limited expulsions of air, thus permitting the gradual formation of a sac.

"3. Hernia of the tracheal mucous membrane between two of the cartilaginous rings, whence the formation of a cavity having the inner surface of its walls supplied with epithelium.

"No post-mortem examination has yet been made in a case of this kind.

"It is an important fact that this form of goitre is generally produced under the influence of repeated and sustained bodily exertions. Heavy occupations and singing expose individuals to the affection.¹ According to Larry it has been observed in those Mussulmans who from the summits of the minarets call out hours.

"Surgical interference would be worse than the disease. The most the surgeon can do is to recommend an apparatus designed so as to inclose the swelling, and to prevent further expansion of the cyst."

Cohen (*Diseases of the Throat*, ed. 1872, p. 395), under the head of fistulae of the larynx and trachea, briefly notes two cases which he presumes to have been cases of "subcutaneous fistula," which were accompanied by the occasional development of a large irregular tumour containing air, the tumour after a little time subsiding. He characterizes the tumours as emphysematous, and states that the laryngoscope failed to detect any abnormal opening.

The cases of Devalz and Faucon above alluded to are condensed in the *Biennial Retrospect of the New Sydenham Society*, for 1873-4, p. 313, as follows:—

"Hernia of the trachea.—At a meeting of the Surgical Society of Paris, on October 1, 1873 (*Gazette des Hôpitaux*, 1873, 129), M. H. Devalz related a case of tracheocele which had come under his notice. Ten years previously, while suffering from an attack of bronchitis, attended with violent cough, the man observed a swelling in the middle of his neck, which rapidly increased. It was at first supposed to be a goitre. Devalz perceived a peculiar murmur, audible with the patient's voice, and sounding something like a very softly uttered 'uwuwu.' The width of the neck at the lower part was increased by strong expiration; when the patient coughed a pyriform swelling was formed on each side of the trachea, giving the appearance of hypertrophy of the lateral lobes of the thyroid gland. On inspiration the swelling collapsed. The right lobe of the swelling extended as far as the clavicle; the left did not. The appearance of the swelling could be prevented by pressing on the trachea. The tumour had a smooth surface, was soft, and readily compressible. Examination of the chest gave normal results, except that in the right subclavian region there were amphoric breathing and pectoriloquy, which ceased when pressure was made on the trachea. The opening in the trachea could not be found by palpation. M. Devalz advised the patient to press on the trachea during coughing, so as to retard the further increase of the sac.

"Faucon relates in the *Archives Médicales Belges*, for January, 1874, two cases of tracheocele, or hernia of the mucous membrane of the trachea. In the neighbourhood of Arras he had under his care a man, æt. 54, who had, to the right of his trachea a swelling of the size of a hen's egg, like a one-sided bronchocele. It differed from this, however, in being soft and elastic, and in being increased in size by coughing, hawking, and blowing the nose. The increase could be felt

¹ [Conf. J. P. Frank (*Epitome*, cap. vi. § 707) on emphysema of cheeks produced by playing on wind instruments. S. E.]

on the application of the hand. Between the larynx and the sternum, on the right side, was a tumour flattened from before backward, divided into two lobes, of which the upper was the smaller; they had the feel of a rabbit's bladder distended with air. Pressure on the vessels above and below produced no change in the tumour. Percussion gave a tympanitic sound, establishing the diagnosis of a hernial protrusion of the tracheal mucous membrane, filled with air. The patient had had the swelling for ten years. It was at first of the size of a walnut, it commenced above and extended downwards. At first it appeared only when the man exerted himself, and receded spontaneously, or under slight pressure. In reducing it the escape of air could be perceived by the finger; but no sound was produced. The difficulty of reduction increased with the duration of the swelling, and to the end of the patient's life it remained as a visible tumour as large as a hen's egg. His voice was like that of a woman. He said that the tumour first appeared during the act of vomiting. As he had suffered for many years from frequent attacks of bronchial catarrh, the origin of the tumour might be due to the repeated paroxysms of coughing.

"In a second case, a child a year and a half old, with a congenital deformity of the lower jaw and lip, and of the neck and sternum, had a swelling of the neck, regarding which it was uncertain whether it was a dilatation of the internal jugular vein, or a hernia of the tracheal mucous membrane. On performing a plastic operation it was found that there was a tumour unconnected with the vessels, along with a tracheocele. The latter was produced by exertion, receded spontaneously, and could also be reduced. It was diagnosed to be the result of a congenital defect in the lining membrane of the trachea."

The following table presents the leading points of the cases noted:—

N ^o .	By whom reported.	Sex.	Age at appearance of tumour.	Situation of tumour.	Auscultation and percussion.
1	Eldridge	Male	25 years	Bilateral	Negative.
2	Gohl (Riegel)	Not stated	Congenital	Not stated	Not stated.
3	Fischer (Riegel)	Not stated	5 years	Median	Not stated.
4	Gayet	Male	Adult	Median	Negative.
5	Cohen	Male	Not stated	Median	As in emphysema (?)
6	Cohen	Female	Not stated	Median	As in emphysema (?)
7	Devalz	Male	Prob. adult	Bilateral	Soft murmur "uwuwu."
8	Faucon	Male	44 years	Unilateral	Tympanic
9	Faucon	Not stated	Congenital	Unilateral	Not stated.

The tumours are described as well defined in all the above cases, except those of Cohen, the brief description of which conveys the impression of a more or less diffused emphysema, rather than that of a distinctly sacculated condition of the parts.

Of the nine cases, five developed after the age of five years, three of the five being adults, and a fourth almost certainly of mature years; two were congenital, and of two nothing is stated which would indicate the age at which the tumour first appeared. In regard to the situation of the tumours, in two it was bilateral, in two unilateral, in four median, and in one is not stated.

The case of Devalz bears the closest resemblance to my own in all essential points, save the existence of a soft murmur under auscultation. In reference to this point it will be observed that of the cases in which

the result of auscultation and percussion is distinctly stated, in two it was negative, in one a soft murmur was heard, and in one the tumour was tympanitic. While Devalz states that in his case, as in all others of which he had knowledge, the result of auscultation and percussion was negative, Faucon appears to have based his diagnosis of one case chiefly upon the presence of a tympanitic resonance. It is, however, evident, in view of the facts, that while tympanitic percussion, or aerial bruit, if present, would be strongly confirmatory of the existence of pneumatocele, their absence would by no means forbid such a diagnosis.

I believe all the cases of this character to be most easily explicable on the supposition of the existence of blind or incomplete internal congenital fistulae of the neck, due, as are external fistulae colli, to the persistence of the branchial clefts or want of union of the branchial arches in the middle line, as long ago described by Dzondi (*De fistulis tracheæ congenitis*, Halæ, 1829) and Ascherson (*De fistulis colli congenitis*, Berolini, 1832). Of the cases of this rare malformation (fistula colli) a large proportion are incomplete, or, at least, in comparatively but few cases has the communication with the internal canals been clearly established. Is it not quite possible, indeed probable, that a similar condition of fistula may exist in which the more external tissues have united, while defect of one or more of the inner layers remain? It is not necessary to assume a condition of patency as regards the inner wall of the air passages. Defect of any layer of this would leave a weak point, ready to yield to any unusual or violent pressure from within, either as a laceration, with consequent emphysema, which is least likely to occur, or as a hernial protrusion. The latter seems to have been the condition in all the cases above noted, save, perhaps, those of Cohen. We do, in fact, find in certain cases of externally apparent fistula colli, a sacculated condition of the tissues near the external opening of the fistula, which only requires the closure of the skin and the insuring of free communication with the air passages to be converted into an air-containing tumour.

That out of the nine cases noted the tumour was bilateral in but two is so far from militating against the idea that the condition is invariably due to congenital fistula, that it strongly confirms it. It is difficult to conceive of the formation of symmetrically bilateral tumours on the supposition of accidental laceration of tissue or of dilation of muciparous follicles. That of the few cases analyzed but two were bilateral is not extraordinary, in view of the exceeding rarity of bilateral fistula colli, a condition which, when found, is invariably symmetrical. (Riegel, *loc. cit.*, Bardeleben, *Lehrbuch der Chirurgie und Operationslehre* 2te Ausg., Bd. III., p. 426.)

Of the nine cases it will be observed that four were of males, one was that of a female, while the sex is not stated in the four remaining. This large proportion of males disagrees with the observed facts as to the com-

parative frequency of the occurrence of congenital fistula colli in the two sexes. Anderson (*op. cit.*) states that out of eleven cases eight occurred in females, while Bardeleben (*op. cit.*, Bd. III., p. 427) says that up to the time of writing no case of congenital *tracheal* fistula had been observed in the male. Riecke (quoted in Todd's *Cyclopaedia of Anatomy and Physiology*, vol. iv. part ii. p. 953) found congenital fistula colli but twice in the examination of thirty-four thousand young men. It may be that the active development of the larynx, which takes place in the male at the time of puberty, may in some aggravate any tendency to the formation of abnormal openings upon the basis of pre-existing weak points: and so, that given an equivalent congenital lesion in individuals of opposite sexes, in the male tumour might result, and in the female no noticeable pathological condition be developed. The number of recorded observations is at best so small that the discrepancy above noticed is hardly entitled to much weight in the discussion of the subject.

Of course, like more facts, those which I have recorded in this contribution are susceptible of more than one interpretation. The appearance of my patient during the inflation of the tumours might easily have suggested to an enthusiastic evolutionist the idea that the case was one of atavism or reversion to the structure of some mycetic, howling ancestor. (Owen, *Comp. Anatomy of Vertebrates*, vol. iii. p. 597.)

As regards the case which I have reported, I am inclined to attribute the always more or less severe dyspnœa not so much directly to the aerial tumours, though the condition was much aggravated by any inflation of the sacs, as to the development of a thick sac-wall, some portion of which was in such a situation as to exercise constant pressure upon the laryngeal nerves, a pressure which would, of course, be increased by the distension of the sac inclosed. As to the presence of distinct and complete sacs there could be no doubt, as the limits of the tumours were uniformly and sharply defined during either collapse or inflation. A sac once established, and thickening of its wall from irritation or subacute inflammation, due to the pressure of air in the tissues, having taken place to an extent sufficient to interfere with respiration under any special circumstances, the then occurring congestion of the parts would necessarily intensify all the morbid conditions, *pari passu*, with which would be the increase of thickness of the sac. The occasional very severe attacks of laryngeal obstruction were probably owing not only to the inflation of the tumours by pressure from within, but to interference with the return of the air, due to congestive swelling of the parts about the opening communicating with the air passages to an extent beyond the power of the tissues to overcome by their mere resilience or elasticity. During one of the attacks of severe dyspnœa, during which, as was invariably the case, the sacs were tensely and persistently inflated, strong pressure on the tumours, while momentarily intensifying the dyspnœa, caused the collapse of the swelling and

temporary relief of the laryngeal spasm. Tracheotomy would undoubtedly have given relief in my case, and it should have been performed. I should have been inclined to go no further in the direction of surgical interference, though it is possible that in a case accompanied by such unique and dangerous symptoms some attempts at a plastic operation might have been justifiable.

I would suggest the need of a more definite and correct nomenclature for the subject of this paper. Tracheal hernia is awkward, and while applicable to some cases, would be incorrect in others. Pneumatocele is indefinite, and has been applied to a totally different lesion. Aerial goitre and bronchocele suggest an implication of the thyroid which does not exist, I have therefore, as corresponding with what I believe to be the true pathology of the condition, adopted the descriptive title of Incomplete Internal Fistula of the Larynx or Trachea, as the case may be.

YOKOHAMA, JAPAN, February 22, 1879.

POSTSCRIPT.—Since mailing the foregoing, I have received from my friend Dr. Billings, Librarian of Surgeon-General's Office, the following note of reference to cases not included above. So far as one can judge from so brief an abstract, these cases may all have been due to congenital deficiency or weakness of the walls of the air passages.

1. *Bull. Soc. Chir. de Paris*, 1861, 2e Ser. i. 529-530. Emphysematous Goitre. Reported by M. Lizé. Girl, 17 years old, from shrieking in difficult labour developed a gaseous tumour in the right side of the neck; it disappeared in two days.

2. *Mém. Soc. des Sciences Méd. de Lyons*, 1868, vii. 381-384. Aerial Goitre. Reported by M. Leriche. Child, 8 months, double gaseous tumour in the neck from coughing; rapidly cured by simple pressure.

3. *Wochenschr. f. d. ges. Heilkunde*, Berlin, 1836, 361, 368. Gaseous Thyroid Tumour. Reported by Behr. Girl, 14 years old, result of coughing; readily cured.

YOKOHAMA, JAPAN, March 26, 1879.

ARTICLE IV.

A CASE OF TORSION OF THE ILEUM. By JAMES C. WILSON, M.D., Attending Physician to the Philadelphia Hospital and to the Hospital of the Jefferson College, Philadelphia.

An examination of the statistics of Leichtenstern¹ shows that, external hernias and malignant tumours being excluded, one death from occlusion or constriction of the intestine takes place in every three hundred to five hundred deaths from all causes in hospital practice. This state-

¹ Ziemssen's Cyclopædia of the Practice of Medicine, American translation, vol. viii

ment is based upon the records of the late Dr. Brinton, of London, and the hospitals of Geneva, St. Petersburg, Vienna, and Prague. At the Anatomico-Pathological Institute in the last-named city there were performed from 1845 to 1873 (with interruptions of the records) 13,105 necroscopies with 45 occlusions of the intestine, or not far from 1 in 300. On the other hand, in the Geneva Hospital at Vienna, of 34,523 deaths, 68 were due to this cause, about 1 in 500. In 1541 published cases collected by the same author, and analyzed with reference to the anatomical cause of the occlusion, after deducting 178 due to cancer, 33 cases only (23 in males and 10 in females), or 1 in 42, were due to twisting of the bowel, this including twists of both the sigmoid flexure and the ileum. Upon another page, however, the writer gives the following analysis of cases of twists of the bowel; 45 twistings of the sigmoid flexure, 23 twistings of a loop of the ileum, 8 of the jejunum and ileum combined; in all 76 cases, of which 23, or 1 in 3.3, were instances in which the volvulus affected the ileum only. It is not difficult to estimate in a rough way from these figures that of the total number of deaths from all causes in the general hospitals of large European cities, 1 in nearly 17,000 is caused by the twisting of some portion of the intestinal tube, and 1 in about 55,000 by a twist of the ileum. I cannot doubt that if the truth with reference to the subject could be reached, a relatively greater proportion of deaths from this cause would be found to take place in private practice. For many cases reported, without an examination after death, as "ileus," "peritonitis," or "inflammation of the bowels," may be cases of torsion, the positive diagnosis from acute strangulation from other causes being almost always, if indeed not absolutely always, an impossible one.

I am aware of the danger of over-estimating the importance of this kind of arithmetical consideration of disease. In the first place, the figures relate to what may be termed a special class of individuals, small in numbers as compared with the whole number of the citizens of a community; a class among whom many, by reason of other maladies, are less liable to those accidents of life which tend to determine intestinal disorders of the kind in question, on the one hand, and among whom, on the other hand, there are some whose previous or present disorders made them especially prone to these very occlusions and constrictions. And in the second place no degree of infrequency in the occurrence of any given malady can affect the possibility of one or more cases of it coming under the care of any individual observer, although an extreme rarity would make it quite certain that many practitioners would fail to meet with a single case in a long lifetime of active practice.

The following case is published as an illustration of one of the rarer forms of intestinal obstruction.

Being in the neighbourhood of the home of a patient suffering from advanced dilatation of the heart, consequent upon disease of the mitral valves, on the evening of February 19, 1879, it occurred to me to pay him a visit, as it is my habit to see him at intervals of four or five days. As I was about leaving, his mother requested me to see another of her sons, who was suffering from what was supposed to be a protracted attack of colic. The lad, E. M., a tall, slim, well-formed youth, was called, *and walked into the room*. His aspect was that of one suddenly and gravely ill; his expression was anxious, and indicative of the most intense pain; his face was of a deadly pallor, the features sharp, the eyes sunken and surrounded by dark rings. Seated before me—he refused to lie down upon a lounge in the room—he gave me the first portions of the following account of his brief sickness:—

He was 19 years old; without occupation, save that of occasionally standing at the counter in his brother's cigar shop. He had never been sick. In truth, to use his mother's expression, he had never taken a dollar's worth of medicine in his life; neither had he received any injury to which the existing disorder could in any way be referred. For some weeks he had observed that his bowels were less freely moved than formerly; but there had been an action every day or every second day. The evening before I saw him he had been obliged to work in a cold cellar some twenty minutes or half an hour, in consequence of the bursting of a water pipe; did not strain himself however, was not wet nor chilled, and after a late supper of bread and tea, went to bed at eleven o'clock, as well as ever, and in good spirits. He awoke at an early hour with a desire to pass water, but succeeded in voiding only a small quantity. At this time the first sensation of pain in the belly was felt. At nine o'clock he ate his breakfast, consisting of bread and butter, "scapple," and coffee. Immediately afterwards he was attacked with intense colicky pains in the belly, and vomited copiously, the matters vomited amounting, according to the mother's statement, to more than a quart, and certainly far exceeding in bulk the food he had just taken. He was observed to be very pale, and from this time he presented symptoms of collapse. Vomiting had continued, always provoked by taking fluids, and occasionally occurring spontaneously. The vomited matter, when nothing had been swallowed, was described as of the consistence of thin gruel, light in colour, but as not having any marked odour. Thirst was urgent, and it was only momentarily relieved by water, cold tea, etc., all of which were promptly rejected by the stomach. Since breakfast he had not attempted to take food. He had passed no urine, nor had his bowels been moved since the morning of the preceding day. Pains, colicky in character, had distressed him constantly. He was anxious and restless, and had passed the day in lying upon the lounge, walking about the room, and going back and forth from his room to the shop. Hot applications to the abdomen, and various doses of ginger, brandy, etc., had been resorted to, without success, in relieving the pain, the vomiting, or the restlessness. His tongue was clean and moist; the extremities were cool, the pulse was small, not corded, 120 to the minute. The pain was referred to the region of the umbilicus, where also there was marked tenderness, which extended downwards four or five inches, but was not present elsewhere. There was slight fulness of the abdomen, much marked in the space between the umbilicus and the pubic arch. The whole belly was tympanitic on percussion without localized dulness or sense

of resistance ; no external hernia was discoverable, nor was there tenderness upon pressure over the inguinal or femoral rings, nor in the line of the femoral vessels.

One-third of a grain of morphia was given hypodermically at once, and twenty drops of deodorized tincture of opium ordered every two hours, or every hour if necessary, to relieve pain ; this to be given with a spoonful of crushed ice, by means of which he was enabled to retain it, as I made sure by waiting until he had taken and retained the first and second doses. Cracked ice, spoonful doses of iced brandy and water, and of beef essence, hot constantly renewed fomentations to the belly, absolute rest in the recumbent posture, with the knees supported by pillows, and artificial warmth to the feet, completed the directions for the night.

It was specially insisted upon that no purgative should be administered.

He passed a restless night. The colicky pains, the anxiety and general distress, the torturing thirst, and the inability to retain more than a spoonful of fluid at a time were augmented ; to them were added the fixed pain and tenderness of general peritonitis, a most distressing tenesmus, *the sensation of a rope drawn tight in his belly*, coldness of the surface, a still more cadaveric pallor, and moderate general distension of the abdomen. The tincture of opium had been given regularly, and retained until about two o'clock, when, the symptoms not being relieved, and the desire to have his bowels moved, and the sensation of something in the bowel that must be voided, being extremely urgent, some officious member of the family interfered to stop the medicine, and persuaded the mother to administer "a dose of salts." The evidence as to whether this last was retained or rejected was conflicting. He sat over a bucket of hot water two or three times during the night, with some transient amelioration of the bearing-down pains. His bowels were not moved, no wind was voided, nor did he succeed in passing water, although the attempt was frequently made. Towards morning the vomiting became less frequent.

I found him in the morning decidedly worse ; collapse was profound, the surface everywhere cool, the extremities cold and bluish ; the radial pulse feeble, flickering, uncountable, the heart sounds faint but sharp ; the tongue clean, red, moist. From time to time he expectorated a clear fluid, which collected in his mouth ; nevertheless, thirst was intense, and only relieved for the moment by drink. The abdominal pain was constant, and greatly increased by movement and pressure, the rectal and vesical tenesmus were most distressing. The belly was still only moderately distended, except in the hypogastric region, which was the seat of a prominent symmetrical oval distension, the long axis of which corresponded to the median line, and the borders of which somewhat abruptly trended down to the less decidedly protuberant surface of the abdomen. His mind was perfectly clear ; the anxiety and restlessness continued.

Half a grain of morphia was given hypodermically, and artificial heat applied to the extremities, with sinapisms to the praecordial region and to the wrists and ankles. A catheter was passed, and about two and a half fluidounces of dark-coloured urine drawn off, the accumulation of twenty-four hours. The escape of urine was the occasion of an exclamation of relief from the poor fellow.

A pill containing extract. opii gr. j, ipecacuanha gr. $\frac{1}{8}$, hydrarg. chlorid. mitis gr. $\frac{1}{4}$, was prescribed to be taken every two hours, and the whole

surface of the abdomen was lightly smeared with the extract of belladonna made soft with glycerine.

In the middle of the day his condition was about the same, save that he was free from pain when quiet, that the tenesmus had ceased, and that the medicine and nourishment in small quantities were retained. There had been no vomiting for four hours. The abdomen was at this time more evenly distended. The anus was not patulous, nor was there at any time any escape of mucus from it.

At half-past three in the afternoon, thirty-two hours after the earliest symptoms, he suddenly became very restless, starting up into a sitting position, and cried out that he was blind. A moment later there was a copious gush of dark thin fluid from his mouth and nostrils, and he fell back dead.

The necroscopy was performed the following day by Mr. Hansell, Dr. Hunter and myself being present. Upon incising the walls of the abdomen there was a free escape of bloody serum; a cross-cut being made, and the walls drawn back, the belly presented a remarkable appearance. The intestines moderately distended with gas apparently occupied their usual position; the colon formed a square, which was filled up by the coils of the small intestine. The vessels showed universal congestion, and the loops of the gut were adherent by a thin layer of very soft lymph. The colour of the bowel, although deepened by the congestion, did not differ to any great extent from the normal, except four or five convolutions occupying the hypogastrium. These were of a deep purplish-black colour, and gangrenous. They were also considerably more distended than the surrounding gut, and taken together they compared exactly with the outline of the circumscribed tympanitic distension observed during life in this region of the abdomen. On careful examination these blackened coils of the bowel were found to constitute a portion of the ileum, five feet in length, tightly twisted upon itself in its mesenteric axis. The lower point of crossing was five inches above the ileo-cæcal valve, the upper a distance above corresponding to the length of the involved portion, five feet. At these two points the gut was flattened out, and, with the corresponding mesentery, tightly twisted upon itself, forming a firm, hard cord-like pedicle, about an inch and a half in length, and a little more than one-third of an inch in diameter; at the distal or lower end of which, abruptly bulged out the globular mass of gangrenous gut, whilst from the upper or vertebral end, branched off in a like abrupt way the two unimplicated portions of the ileum, the upper continuous with the intestinal tube above, the lower passing by a few inches of its lowest part into the large bowel. The twist was from left to right, and amounted to a complete turn (360°) upon the vertebro-enteric axis of the mesentery. One of the epiploic appendages attached to the sigmoid flexure by a rather long foot-stalk of peritoneum was caught in the twisted end of the volvulus. The intestines both above and below the strangulation were moderately distended with gas; the distension of that part of the ileum included within the twist was somewhat greater than elsewhere. This portion contained a moderate amount of bloody fluid. Its mucous membrane was softened and shreddy. A few lumps of feces of the consistence of putty were found in the upper portion of the colon. At no point in the course of the bowel was there excessive dilatation, or preternatural accumulation of bowel contents; nor were there signs of foregoing inflammatory trouble, such as bands of lymph, old adhesions, and the like. The mesentery of a portion of the gut was unduly

long, that of each end of the same portion short, and by an accident to which this anatomical arrangement had made the lad long liable, those coils of the bowel to which the long mesentery gave increased freedom of motion, turned around the mesenteric axis, the portion involved being limited by the position of the shorter mesentery at each end, and strangulation occurred. The resulting sequence of events was that which takes place whenever there is acute strangulation of the intestine, as in hernia. Deep and rapidly increasing congestion of the strangulated parts, local enteritis implicating all the coats of the bowel, gangrene, and at the same time general peritonitis. Step by step with these processes, the evolution of gases, products of the rapid decomposition of the intestinal contents, takes place within the strangulated gut. The resulting augmentation of bulk tends at the same time to prevent its untwisting by wedging the volvulus more tightly among the surrounding organs, and to tighten the constriction by traction in the direct line of the twist.

The kidneys were normal in size and structure, but showed intense congestion, the blood dripping freely from them in section. The ureters were not compressed, and there was no hydronephrosis. The bladder was empty.

No other organs were examined.

The symptoms in the foregoing case, taken together, form a typical description of acute strangulation of the gut high up. There was nothing wanting. The sudden onset; the free and repeated vomiting; the pain referred at first to the umbilicus, and tenderness in that region; colicky paroxysms from the vermicular motion of the unimprisoned bowel; the oliguria amounting to almost total suppression; the vesical and rectal tenesmus; the rapidly on-coming shock, which deepened from hour to hour, make up a clinical record not difficult to decipher. The absence of any previous illness, of external hernia, of any tumour or area of abnormal percussion dulness in the line of the colon or elsewhere in the abdomen, seemed to exclude a large group of the anatomical causes of the strangulation. There remained, however, as possible causes of the formidable array of symptoms presented by my patient, strangulation by the omentum, by diverticules from the intestine, by the appendix vermiformis, strangulation in holes and fissures of the mesentery, in openings abnormally present in different organs, the knotting of loops of bowel, kinking of the bowel, internal hernias, and torsion or twisting, all of which have been found, in varying frequency, to be the cause of acute intestinal obstruction. The difficulties in the way of a differential diagnosis between these conditions during life, without an operation, are in the present state of our knowledge insurmountable. With the experience derived from a very careful study of the case, as compared with numerous recorded cases, I am disposed to regard two symptoms present in it as of value as pointing to torsion. Of these the first is a subjective one, that of the marked sensation of a cord drawn tight inside the belly; the second is objective, the oval symmetrical protuberant distension in the hypogastrium, forming a circumscribed bulging in an abdomen elsewhere moderately tympanitic.

The last was of short duration, disappearing as the meteorism became more marked and general.

With reference to treatment, the question that the physician, face to face with a case of acute intestinal occlusion, must ask himself, is, whether a spontaneous cure is possible, or the abdomen must be laid open and the block relieved by direct mechanical means in order to avert death. As he considers the answer, it is not to be forgotten that the fatal termination may be near at hand. In cases of strangulation by twists it has taken place within twenty-four hours, while the average duration is four days. And the average duration of acute occlusion from all causes is set down by Leichtenstern¹ at six days, the range being between eight hours and thirteen days. Whilst there may be time for deliberation, for the most critical study of the case, for the treatment of shock and of the inflammation by which death is brought about, there may on the contrary be no moment to spare; the only hope for the unhappy patient may lie in the prompt resort to the operation of laparotomy. The measure of the immediate danger is the intensity and continuance of the shock. Collapse, deepening from bad to worse, until it becomes profound, as was seen in this case, in which death occurred from cerebral anaemia in the thirty-second hour, calls for immediate operative interference. It is at once indicative of the extent of the injury and the intensity of the force producing it. Here the intestine to the length of five feet was cut off from the circulation, and by a twist almost as hard as a hempen cord and not thicker than one's little finger. The result was not due to the obstruction of the bowel, nor to the enteritis which followed; it was due to shock. Such was the condition of the bowel, that had the strangulation been relieved the morning of the day of the patient's death, recovery could scarcely have occurred. Yet the previous evening he was walking restlessly about the house, having been well twelve hours before, and suffering from what he regarded as a troublesome attack of "colic." The indications for treatment were clearly the relief of pain by opium and belladonna, the administration of stimulants, the use of artificial heat, rest in the most comfortable posture. The uselessness and the danger of forcible enemata are pointed out by Dr. Allbutt in a recent paper.² The number of spontaneous cures that have occurred after the gravest symptoms of intestinal occlusion, such as sterecoraceous vomiting and the like, though not great, is so considerable, that to have resorted to laparotomy to make reparation of a bowel misplaced in a way unknown, would have been at that time, although the only treatment as the event proved at all likely to be successful, an undertaking not less heroic than the use of the drastic purgatives, in vogue as recently as the days of Rousseau.

¹ Loc. cit.

² British Medical Journal, Jan. 11, 1879.

ARTICLE V.

DEFORMITY OF SHOULDER FOLLOWING NERVE INJURY. By L. McLANE TIFFANY, M.D., Professor of Operative Surgery in the University of Maryland.

WHILE injury to the posterior circumflex nerve is recognized as a possible complication in dislocation at the shoulder, and as such is mentioned in the usual text-books, yet the signs of such an affection are perhaps capable of further translation. These signs are usually very plain, and demand early recognition, not only because a complete diagnosis is essential to the patient's welfare, but because an intelligent prognosis is essential to good surgery. The following, therefore, is offered as elucidating somewhat a condition of affairs rarely very obscure.

CASE I.—J. Q., aged 33 years, a strong, healthy sailor, slipped and fell on the deck of his vessel while attempting to grasp a rope. On rising, the left arm being useless, he descended to the cabin; there was then "a lump in front of the shoulder, and the bones on top stuck out" (his own words). He was laid on the floor by four shipmates, who pulled upon his arm with all their force; after a while the "lump went away." Since the fall he has been unable to perform seaman's duty, for he cannot raise the elbow from the side. Twenty-four days after injury, his condition is thus described: the affected arm hangs easily, the elbow touching the side; the hand can be placed upon the opposite shoulder; the shoulder has lost the normal contour, being somewhat flattened; there is a depression beneath the acromion, the deltoid muscle feels more soft than natural. Measurement shows the circumference of the deltoid to be half an inch less on the affected than on the well side; from the acromion to the external epicondyle is, on the affected side, three-quarters of an inch longer than on the well side. There is a fulness over the anterior aspect of the joint. By pressing the elbow upwards towards the socket, the head of the humerus returns to the normal position, the contour of the shoulder is restored, and the distance between the acromion and epicondyle equals that between the same points on the other side of the body. The interrupted current produces no contraction of the deltoid. Commencing one and a quarter inch below the acromion over the deltoid is an area of cutaneous anaesthesia seven inches long by two and three-quarters inches broad, of irregular outline, the long diameter corresponding to that of the arm, the apex situated at the humeral attachment of the deltoid. This anaesthetic territory is surrounded by a zone one-third of an inch broad, of intense hyperaesthesia, which gradually fades into normal sensibility.

Immediately after the accident J. Q. suffered from loss of power, together with pain in the thumb, index, and middle fingers of the left hand; this, however, passed off in a week, leaving no ill effects. At present the fingers are in all respects normal.

While passive motion of the joint can be made to nearly the normal extent unaided, motion is greatly limited; thus directly forwards, the elbow being straight, the arm can be elevated only to an angle of 45° with the vertical, showing implication of anterior deltoid fibres. On attempting to carry the hand to the mouth, the elbow is sharply flexed, and

the forearm then slid along the front of the chest, the head is strongly inclined, and sometimes the finger tips touch the mouth, sometimes not. Elevation of the arm directly outwards from the side is impossible, implication of middle deltoid fibres; so also elevation of arm outwards and backwards is impossible, implication of posterior deltoid fibres. The loss of motion in these two last directions largely restricts the usefulness of the hand; thus he is unable to touch his back above the buttocks, the side above the ilium, and places the hand in his pocket with difficulty and very slowly, the member being in strong pronation. When attempts are made to use the arm, the trapezius and great pectoral muscles are brought into strong action, so as to move the entire shoulder, and thus compensate for the deltoid insufficiency. Rotation of the humerus outwards, supination, is weaker than in the opposite arm, implication of teres minor(?)

The above history points to a lesion of the posterior circumflex nerve, which, taking its origin from the posterior cord of the brachial plexus, winds around the surgical neck of the humerus to be distributed to the deltoid muscle and skin over it, the teres minor, and shoulder-joint. The impaired use of deltoid, cutaneous anaesthesia and diminished supination from supposed teres paralysis all conform strictly to the anatomical relations of the nerve in question, and were confirmation required, it would be found in the temporary pain and loss of power experienced by the patient in the thumb, index and middle fingers, parts supplied by the radial nerve, the proper continuation of the posterior cord.

A certain roughness of the joint was present when J. Q. was first seen, but it would be useless to speculate as to whether such a condition were due to nerve injury or the direct violence of luxation.

Taking the patient's description of the accident, it is fair to suppose that he sustained a dislocation of the left humerus, subcoracoid, and inasmuch as the head of the bone was promptly replaced by strong traction, the question at once presents itself, was the nerve lesion produced by dislocation, or by the violence exerted in effecting reduction? While it is not to be denied that strong and prolonged traction might injure the circumflex nerve, yet it does not seem likely that forcible reduction of a luxation would cause greater injury than the violence which caused the displacement; nor is it necessary that the nerve lesion should be preceded by a luxation, for simply stretching or jarring a nerve may seriously impair its action,—just as stretching a nerve may so modify its nutrition as to cure a persistent neuralgia.

Of such an injury to the posterior circumflex without dislocation of humerus the following is an example:—

CASE II.—A. B., white, a strong, healthy man, while driving a carriage was thrown from his seat, striking the ground on his left shoulder. He was seen shortly afterwards by a physician, who pronounced his injury a bruise, recommending rest for a few days, and subsequently a stimulating liniment. When seen by me, three months later, drooping of the shoulder, inability to raise the arm outwards from the side, flabbiness of the deltoid, and fulness over the anterior aspect of the joint were all present. Questioning

elicited no history of cutaneous anaesthesia, nor was it present at the time of my examination.

In this case there was present deltoid paralysis, yet no dislocation at the shoulder had occurred, nor had the patient been subjected to violent manipulation of the affected limb in attempted reduction. It is fair to presume that the posterior circumflex nerve was injured by the shock of the contusion, or else that the humeral head was thrust partly from the socket so as to injure the nerve, returning to the glenoid cavity when violence ceased, a not very likely hypothesis. This patient was seen but once, so the progress of the case is unknown.

J. Q., however, remains under observation, receives in the way of treatment the constant current, and is slowly regaining the use of the arm, while the cutaneous sensibility is increasing. It is a noteworthy fact that improvement did not commence until more than two months after the accident, which would suggest a guarded prognosis in cases of similar nature. The prognosis in regard to complete recovery is a question of vital importance, as also the probable duration of impaired nerve function. In a certain number of cases the paralysis is permanent. In *Cooper's Surg. Dict.*, vol. i. p. 527, Desault is credited with two cases of complete paralysis, one permanent, the other disappearing in fifteen days; Boyer with three cases of deltoid paralysis, one being permanent; Nelaton with one which disappeared in ten days. Inasmuch as there does not appear to be any very certain method of distinguishing between a nerve strained, or completely torn across, at once, it is not possible to express an opinion in respect to entire recovery when the patient is first seen.

The appearance presented by a shoulder affected in the manner stated is very suggestive of partial dislocation, were such a condition of affairs possible, and might give rise to the idea, if seen some time after the receipt of the injury, that a dislocation had occurred, and had not been reduced. The fulness which is apparent at the anterior aspect of the joint I ascribe to the lax condition of the deltoid, which permits the head of the humerus to slip downwards until the convexity rests upon the prominent lower rim of the glenoid cavity; the recumbent position, or pressing the elbow upwards, both cause the fulness to disappear. I would suggest as a possible hypothesis that the teres paralysis permits the head of the humerus to fall forwards towards the anterior edge of the socket.

At present, four months after the receipt of the injury, cutaneous sensibility is restored, hyperesthesia is present only at the posterior edge of the deltoid above the axilla. Paralysis of the anterior deltoid fibres has greatly improved, of the middle fibres less, of the posterior fibres least; depression below acromion still marked; patient can pass left hand over his whole scalp, can touch back above buttocks, and continues to improve slowly. The anterior prominence over joint remains, as also a corresponding depression beneath the acromion behind; some slight roughness of the socket is present; pressing the elbow upwards, and the anterior projection

backwards restores the normal contour of the parts; this, however, is much more difficult than formerly, and may ultimately result in permanent so-called partial dislocation.

Practically, the early recognition of the trouble in question is of prime importance, since the prognosis of a dislocation will vary greatly according as nerve injury be or be not present. It is, and for some time has been, my custom, within a week after the receipt of an injury to the shoulder to remove all bandages, and cause the patient to execute such motions as necessitate the use of different portions of the deltoid muscle, the better to corroborate my diagnosis; for a patient will receive, shortly after an accident, an unfavourable opinion with a certain amount of equanimity, while the same opinion delivered two months later for the first time, will subject the surgeon to much possible criticism as to "why he did not find out sooner what was the matter?" All the more advisable is it in view of Case 2 to examine for paralysis when there has been no dislocation.

ARTICLE VI.

ON ABDOMINAL DRAINAGE OF ADHERENT PORTIONS OF OVARIAN CYSTS AS A SUBSTITUTE FOR COMPLETED OVARIOTOMY. By LEWIS A. STIMSON, M.D., Surgeon to the Presbyterian Hospital, New York.

A FEW weeks ago it was my fortune to witness an operation undertaken for the removal of an ovarian cyst by one of our most experienced and skilful gynaecologists, to be present at the death of the patient four hours afterwards, and to share in the grief caused by the loss of one whose life had been spent in unselfish devotion to others and whose watchfulness kept want and care from many sick and feeble.

Death, in all its forms, is only too familiar to the physician, but when it follows with brutal haste upon an attempt to relieve, undertaken confidently after mature deliberation, guided by full knowledge and experience, and executed with precision and skill, it forces upon us a crushing sense of responsibility and renews the conviction that our art may sometimes be more potent for harm than for good. If a rule of conduct is to be drawn anew from that sense and that conviction, it is not that we must refuse to interfere, but that we must learn from our reverses, enlarge our knowledge, and improve our methods. The maxim that our first duty is to do no harm—*primum non nocere*—is not intended to reduce us to the rank of simple spectators; it is to stimulate us to attain greater accuracy in diagnosis, greater skill in treatment, and quicker perception of indications. In the hope of furthering those objects I have ventured to follow out some lines of thought suggested by this case, which presented some of the most serious complications of ovariectomy.

The patient, 38 years of age, had an ovarian tumour which had grown in four years from the size of a duck's egg to that of a three months gravid uterus. She had suffered much from peritonitic and uterine trouble, and five weeks before the operation had a sharp, though short, attack of peritonitis which was followed by rapid increase of the cyst and by a low fever, which confined her to the bed for four weeks. The fifth week was spent in an attempt to improve her general condition, but, as the tumour continued to increase and the distress was great, further delay was considered unjustifiable, and the patient was placed upon the table eager for the operation and happy in the hope of a permanent and complete cure. When the peritoneum was reached it was found thickened and vascular and closely adherent to the sac. The adhesions, which occupied an area extending to the umbilicus above and to a distance of three inches on each side of the incision, were torn with the fingers and steel sound. In accomplishing this the sac was ruptured and was then emptied of its thin purulent contents by turning the patient upon her side. The sac, which had a capacity of about three quarts, was forcibly separated from some adherent intestinal loops and partially removed, its deeper portion being treated as a pedicle and fastened into the abdominal wound by transfixion with three of the silver sutures used to close that wound after the peritoneal cavity had been cleaned. The entire operation, including the dressing, occupied about three-quarters of an hour, and at its close the operator expressed the opinion that peritonitis would certainly supervene and prove fatal. The patient was taken from the table pulseless and remained so until her death, four hours afterwards.

The fatal issue was, of course, the result of shock; but, leaving aside that point for the moment, let us consider the facts which were the basis of the grave prognosis given at the close of the operation, that of a probably fatal peritonitis, a prognosis amply justified by recorded experience.

These facts, exclusive of those belonging equally to every ovariotomy, were the existence of extensive adhesions and the purulent character of the contents of the sac. The latter was more than suspected before the operation was proposed, and its principal importance seems to lie not in itself but in its consequences antecedent to removal; that is, in the deterioration of the general condition of the patient and in the adhesions to which the inflammatory process, associated with the suppuration, gives rise. In itself, suppuration of the sac is not a cause of peritonitis after an operation, unless the pus should escape into the peritoneal cavity and not be entirely removed therefrom. In this case the pus did not come into contact with the peritoneum, and the source of the danger must therefore be sought in the adhesions.

All authorities agree in considering the existence of adhesions a complication, the gravity of which varies directly with their number, extent, and solidity, because of the danger that their rupture may excite peritonitis, or that the bleeding from their torn vessels may lead to septicæmia. The danger lies not in the existence of the adhesions, not in the antecedent inflammation or irritation that has caused them, but in their rupture, in the possible spread of the new inflammatory process set up by the

local injury. Indeed, many surgeons consider that the processes which produce the adhesions modify at the same time the remaining surface of the peritoneum and render it less liable to take on acute inflammation, so that if it were not necessary to separate the surfaces thus adventitiously united the danger of ovariectomy would be less when adhesions exist than when they do not. Dr. Peaslee¹ quotes in this connection Dr. J. Clay's statistics showing that the mortality when there were no adhesions was 30 per cent., when there were slight adhesions 40 per cent., extensive adhesions 50 per cent., and extensive adhesions requiring ligatures 70 per cent. Koeberle's statistics, quoted also by Peaslee, give a mortality of 15 per cent. when there were no adhesions, 19.8 per cent. with slight adhesions, and 45.5 per cent. with grave adhesions. It is not easy to accurately tabulate reported cases with reference to this point because of the insufficiency of detail concerning the extent and character of the adhesions, but I have tried to draw some conclusions from the three hundred cases of ovariectomy reported by Mr. Spencer Wells in Vol. Ix of the *Medico-Chirurgical Transactions*, 1877.² These are the three hundred following his first five hundred cases. The rate of mortality in cases in which the presence of adhesions of any character is noted is more than one-half larger than in those cases in which there were no adhesions, and this increase is due to peritonitis, septicæmia, or exhaustion; in other words, to conditions originating in the greater violence inflicted upon the patient. Many of the adhesions must have been of the kind described by Dr. Peaslee as "physiological," in distinction from "pathological;" that is, slight non-vascular adhesions due to prolonged contact of two surfaces without inflammation. As their rupture involves no bleeding or violence, their rate of mortality is probably nearly as low as that of uncomplicated cases, and therefore the rate of mortality of the tougher "pathological" adhesions would be correspondingly higher than the average, 30.8 per cent., of the two combined. Upon this point, unfortunately, we can get no positive information from the statistics. The adhesions in Mr. Wells's table are described simply as "parietal," "intestinal," "omental," "pelvic," etc., and, if we assume that in the cases in which two or more of these terms are used together the adhesions were tougher and more extensive than in those in which only one term is used, we have 76 cases of compound adhesions furnishing 28 deaths, a mortality of 36.8 per cent.; and if we take 3 cases in this table in which the adhesions were certainly very extensive and strong, we have a mortality of 66.66 per cent.; or,

¹ Ovarian Tumours, p. 377.

²	No. of cases.	Deaths from septi- cæmia, peritonitis, or exhaustion.	Deaths from other causes.	Total deaths
No adhesions . . .	128	18 = 14 per cent.	6	24 = 18.7 per cent.
Adhesions . . .	172	47 = 27.3 "	6	53 = 30.8 "
	300			77 = 25.66 per cent.

adding to them 3 similar cases that have come under my own observation, 6 cases with 5 deaths.

It is unnecessary to dwell longer upon this point. The danger of tearing firm adhesions is thoroughly understood, and the writers upon ovariotomy, appreciating this danger, have even declared distinctly and repeatedly that, as no man can surely foresee the condition of the sac and its relations with the wall and viscera, the abdominal incision must always be regarded at first as merely an exploratory one, to be merged afterwards into an ovariotomy if the conditions disclosed by it justify that operation. This is sound advice, but it does not seem to be often embodied in practice, if we can judge from the scantiness of the records of abandoned operations. The reasons are not obscure. No rule of practice has been laid down for guidance in these cases except in vague and general terms. We are told that if the adhesions are "too extensive" the removal must not be attempted; but how is the operator to know whether they are or are not "too extensive"? He may learn of the presence of the deeper ones only after he has torn those which lie near his incision, and then comes the natural reflection that he has already gone too far to turn back. *On ne va jamais si loin que quand on ne sait où l'on va.* No one likes to abandon an attempt, to confess his powerlessness; and there are enough instances of rare success under unfavourable conditions to encourage an operator to persevere when once fairly committed to the attempt; false beacons that serve to wreck and not to save. If the case does well, the surgeon congratulates himself; if it does ill, he consoles himself with the thought that the fatal issue was inevitable. Moreover, he seems to have no alternative. He must either give the patient the slight chance which the completion of the removal offers, or he must abandon her to her fate. But is that the only alternative, and is that abandonment as hopeless as it sounds? Mr. Wells's experience casts a light, even if a feeble one, upon this question. In the seven years following 1865 he abandoned the operation or left it incomplete 19 times for various reasons.¹

In 3 of the cases the cyst was tapped and the abdominal wound closed; the recorded result is "relieved as after simple tapping."

In 7 cases of partial removal all died.

In 2 cases, one of ruptured cyst and adherent dendritic tumour, the other of adherent papilloma of both ovaries, the interference was restricted to cleaning the peritoneal cavity; the patients recovered.

In 1 case of ruptured cyst, with cancerous nodules all over the peritoneum, the liquid was removed from the peritoneal cavity, and the patient died on the 30th day.

In 6 cases he emptied the cyst and fixed it to the edges of the abdominal

¹ Table quoted by Peaslee, loc. cit. p. 393.

incision in such a manner that its permanent drainage was assured ; 2 of these 6 died, on the 4th and 20th days.

If we group these nineteen cases in three classes of (1) abandonment, (2) partial removal, and (3) substitution of drainage for ovariotomy, we have six cases of abandonment, of which only one, and that a case of generalized cancer, died ; the others were "relieved," and of one of them it is said that she was improving in health and strength five months afterwards.

Even if we admit that this relief was only temporary, and that all succumbed ultimately to the progress of the disease, this result is much to be preferred to that of the second class, which gives seven cases of partial removal with seven deaths.

The third class contains six cases in which the adhesions were left untouched, and the sac treated by permanent drainage through the abdominal incision ; of these, two died and four were *cured* (not merely relieved), a mortality of 33.3 per cent., which is less than that, 36.8 per cent., of the completed operation in the 76 cases of compound adhesions mentioned above.

It is usual to speak of permanent drainage of an ovarian cyst as a very fatal procedure, and, so far as I have been able to learn, it is rarely resorted to ; but Dr. Thomas¹ says of it that a certain class of cases can be treated in no other way, and that "it offers a chance of permanent cure almost equal in proportion to two out of three," an estimate which corresponds exactly with that just drawn from Mr. Wells's statistics. He also gives² Scanzoni's record of fourteen cases of drainage through the vagina, of which eight were cured, two relapsed in a few weeks, three were lost sight of, and one died of typhoid fever two months after the operation. Dr. Peaslee³ furnishes similar testimony ; he quotes six cases treated by Dr. Noeggerath by permanent drainage through the vagina, with five cures and one death, and says "I regard this operation (Dr. Noeggerath's) as being of the highest value in those cases of ovarian cysts to which, on account especially of adhesions, ovariotomy is not applicable." It does not appear in his analysis why this operation is not equally applicable to many other less complicated cases, for its mortality, 16.66 per cent., is less than that, 18.7 per cent., of ovariotomy even under the most favourable conditions, and there is nothing to indicate that the survivors were not completely cured. Apparently the subsequent record of this operation has not been so favourable, for Dr. Thomas, writing four years later, says Dr. Noeggerath's "success has not been encouraging thus far, but he is favourably impressed in regard to the plan, and attributes his unfavourable results to the fact that the cases upon which he has operated have most of them been complicated by malignant or other serious disease."

¹ Dis. of Women, pp. 712 and 713, 4th edition, 1876.

² Loc. cit. p. 708.

³ Loc. cit. p. 221.

The reason for the preference of ovariotomy is possibly more moral than surgical, and in a measure the unconscious outcome of natural impulses in the mind of the surgeon rather than of the indications furnished by the disease. The career of ovariotomy has been so rapid and brilliant, its results have been so favourable when compared with those of previous non-interference, and the stimulus to seek a share in the fresh triumph is so great, that it is only natural for a surgeon to perform the operation when the opportunity presents itself, and to be satisfied that he has done his duty by his patients if his rate of mortality does not exceed the recorded average which he is only too willing to accept as the measure of the inevitable results of causes inherent in the disease or operation and beyond his control.

Meanwhile nothing is done to diminish this average. Dr. Thomas¹ has pointed out very forcibly the advantages which experience gives in this operation, but Mr. Wells's last 300 cases show a higher rate of mortality than the preceding 300. He explains² this on the theory that the practice of ovariotomy having become more general, he receives from other practitioners a larger proportion of the more unfavourable cases and a less proportion of the simple ones, and also because he has substituted simple tapping for ovariotomy in many simple uncomplicated cysts; and, finally, because, encouraged by some unexpected successes, he has accepted the slight chance offered by an operation in some cases which he would formerly have considered absolutely hopeless. There is reason to think that these influences would be fully compensated for by the fact that his success and increasing reputation would tend each year to bring cases to him at an earlier period in their course, and therefore enable him to select his time and operate with a greater chance of success. His statistics do not give sufficient details to enable us to determine the character of the complications, but if we arrange the successive hundreds according to the existence or non-existence of adhesions, we have the following table:—

	NO ADHESIONS.			ADHESIONS.				Total.
	Cases.	Deaths	Mortality.	Cases.	Deaths	Mortality.	Total.	
1st 100	36	13	36.1 per cent.	64	21	32.8 per cent.	34	
2d 100	34	4	11.7 "	65	23 ³	35.3 "	27	
3d 100	34	6	17.6 "	66	16	24.2 "	22	
4th 100	41	6	14.6 "	59	16	26.9 "	22	
5th 100	43	8	18.6 "	57	11	19.3 "	19	
6th 100	7	13	27.6 "	53	16	30.1 "	29	
7th 100	41	6	14.6 "	59	18	30.5 "	24	
8th 100	40	5	12.5 "	60	19	31.6 "	24	

¹ Loc. cit. p. 740.

² Medico-Chirurgical Trans., vol. lx., 1877.

* Exclusive of a case in which death, attributed to "cancer," occurred six weeks after the operation.

which, if it can be relied upon to show anything, shows that the number of complicated cases in the last 300 is 172 as against 182 in the 300 just preceding, and that the fatal cases among these were respectively 53 and 43. Even if we accept his first and third reasons as a sufficient explanation of this increase, we cannot admit that there is anything in the record to show that his experience had enabled him to obtain a greater degree of success in the treatment of adhesions at the termination of his active career as an ovariotomist than shortly after its beginning.

Dr. Peaslee¹ writing in 1872 says: "the great desideratum, therefore, at present is an improved method of treating them" [adhesions]. But that improvement has not come. We possessed then all the means we possess now: ligature, cautery, styptics, acupressure; and Mr. Wells's 300 operations performed since that date show a greater mortality in this class than the preceding 300. It is not probable that any man will operate more frequently than Mr. Wells has done, and even if one should do so it is not to be expected that even a hundred additional operations would teach him anything that he has failed to learn from eight hundred. The conclusion then seems to be unavoidable that ovariotomy must be fatal in about one out of every three cases complicated by adhesions, if those adhesions are torn and treated by the means now at our disposal. This is a very serious mortality and, as I have already pointed out, is not materially less than that on which Dr. Thomas² characterizes drainage of the sac as too dangerous ever to become popular.

It is true that much better results have been obtained by Dr. Keith, of Edinburgh, and by Mr. Thornton, the pupil and successor of Mr. Wells at the Samaritan Hospital, and that under the impulse given especially by the former the complete Lister method has been adopted in the last four months by ovariotomists with an enthusiasm that recalls its adoption by general surgeons a few years ago. Dr. Keith's statistics, published in the *British Medical Journal* for January 5, 1878, show a most remarkable success, and one that has increased regularly with each succeeding set of 50 cases, the mortality of the first 50 being 11, that of the fifth 50 only 4. In seven years he has not lost a single case of simple ovariotomy uncomplicated by adhesions, and his record is all the more remarkable for the fact that the presence of adhesions is noted in a much larger percentage of cases than in Mr. Wells's statistics. This success was obtained practically without the Lister method, for this method was used in only 21 of his last set of 50 cases, and of these 2 died, so that his estimate of its value is rather in the nature of a prophecy than of a deduction from experience. Moreover, in a later article (*Ibid.*, October 19, 1878), in which he gives a table of 49 cases treated antiseptically with only 2 deaths, he says "the mortality of ovariotomy has with me got less and less every year

¹ Loc. cit., p. 393.

² Loc. cit., p. 712.

since I began it, till in the year before antiseptics it had fallen to 5 per cent.," a percentage which is only 1 greater than that obtained afterwards by the use of antiseptics. He attributes his success to drainage by large glass tubes, cauterization of the pedicle (for which however he substituted the clamp in 40 of the fifth 50 cases), the use of compression-forceps to prevent loss of blood, and to the use of ether instead of chloroform. All of these measures are and have been in use by other surgeons, and yet the general results, so far as can be judged in the absence of statistics, are far below Dr. Keith's. It seems probable that his success is a personal one, one due to the man rather than to the method, the result of a devotion and enthusiasm which are indicated in the fact that most of his cases were treated in a private hospital established by him and maintained mainly at his own expense.

I am a thorough believer in the value of the complete Lister method, but I do not think the propriety of depending upon it in all cases of ovariotomy is yet established; and there are reasons for thinking that the prolonged exposure of the peritoneum to the carbolized spray and the carbolic solution may have consequences as serious as the septicæmia which may thereby be averted. Mr. Lister himself, in commenting on Dr. Keith's last paper (*Brit. Med. Journ.*, Nov. 1878, p. 733), confines himself to the cautious statement that while he had formerly advised against the use of his method in ovariotomy, through fear of the irritation of the peritoneum, he now expected greater safety in small operations from the use of the spray. Any one who has experienced the irritating effect of the spray upon his own hands may well dread its influence upon the more sensitive peritoneum, and when we remember that simple washing of the body with the carbolic solution for the cure of scabies has caused death three times by carbolic poisoning (*Von Langenbeck's Archiv*, vol. xxiii), we may well hesitate to incur the risk of the same absorption by the much more actively absorbent peritoneum.

A striking proof that the Lister method is not in itself sufficient to produce exceptionally excellent results is shown incidentally in Dr. Keith's last article, by the statistics of four German ovariotomists, who lost 33 out of 155 cases treated antiseptically, a mortality of over 21 per cent.

Let me now repeat the somewhat scanty statistics of drainage as an introduction to the question of the propriety of systematizing it and substituting it for ovariotomy when the sac is adherent. Mr. Wells drained the sac in 6 cases, after having found the adhesions too firm to admit of removal; of these 2 died, one on the 4th, the other on the 20th day. Dr. Noeggerath established permanent drainage through the vagina 6 times, with 5 cures and 1 death. Scanzoni did the same 11 times without a death, and 3 times without known result. Dr. Thomas gives a table of 33 cases of drainage through the abdominal wall with 12 deaths (36.3 per cent.), but he offers it only as an imperfect report on account of the difficulty of dis-

tinguishing between drainage and simple tapping, and he adds, "In some cases the entire sac was filled with pledgets of lint saturated with caustic solutions; in some, threads of worsted or other substances were rolled into balls, dropped into the sac, and the ends allowed to hang out of the incision," measures which certainly were not likely to diminish the danger of the operation, and, if used at all, should have been reserved until the sac had contracted.

The mortality of Mr. Wells's cases may be safely taken as the maximum, because the adhesions, being of the firmest and most extensive kind, must have opposed the contraction of the sac and prolonged the period of suppuration, and because drainage was undertaken only after the abdominal cavity had been exposed to the air, and its contents manipulated. The cases combine therefore the dangers of laparotomy associated with exploration and possible rupture of the adhesions first encountered, and those peculiar to prolonged drainage. It is not unlikely that in the case which died on the 4th day the fatal issue was due to the exploration and not to the drainage, and that if the sac had been drawn immediately into the abdominal incision, stitched fast there, and then drained, the result would have been different. I have but little hesitation in expressing the opinion that a sac adherent to the abdominal wall on each side of the incision could be safely treated in the great majority of cases by simple incision and drainage, especially under antiseptic rules, for such a method would involve no injury to, or exposure of, the peritoneum, and the sac would shrink and close like an ordinary abscess. I believe also that a cyst not adherent at this point could be drawn into the incision as soon as it presents, fixed there, opened and emptied, its character and relations with the viscera satisfactorily determined by the hand introduced into its cavity, and then treated either by ovariotomy or by drainage, according to the light furnished by that examination, with a larger measure of success than is now the rule; for the exploration would not increase the danger of the operation in the cases in which ovariotomy should be afterwards resorted to, and it would prevent its performance in those cases which now give it the highest rate of mortality, and substitute for it a much less fatal method.

This is not a proposal to substitute drainage for ovariotomy in all cases. It is only an amplification of the principle laid down by all writers that the abdominal incision must be made as an exploratory one; it is an attempt to insure the making of that exploration, and a proposal to substitute exploration from within the sac for exploration outside of it; and, finally, to restrict ovariotomy to the simpler cases, and substitute drainage for it in the complicated ones.

If the surgeon's first act is to break up firm vascular adhesions it cannot be properly called an exploration, and yet the cases in which this is done are the very ones in which a real exploration is most necessary. In many cases, especially of single cysts, it must be possible to learn all that needs

to be known of the character and relations of the tumour from within the sac. Dr. Thomas¹ says of Simon's method of exploration through the rectum that "by it the examiner is enabled to hold the ovaries between the thumb and finger and appreciate their size, consistence, and smoothness; to discover tumours of the uterus no larger than a cherry; to ascertain the length of the pedicle of an ovarian cyst, and the freedom from attachments of the cyst itself." What is possible to his skilled touch acting under such unfavourable conditions must be within the power of any hand moving within a sac whose cavity is so much larger and whose walls are usually no thicker than those of the rectum. Even if this exploration should require more time than is usually given to this stage of the operation the patient is not harmed by the delay, for the sac fills the incision completely, and the peritoneum is not exposed to the air. Any such delay would be fully compensated for afterwards, for no time would need to be spent in arresting bleeding from torn adhesions or in cleaning the peritoneum, and the two principal causes of peritonitis and septicæmia would be avoided, for the peritoneum would be subjected to no violence, and no blood would escape into its cavity.

The operative procedure would be:—

1. Incision of the abdominal wall in the usual manner.
2. Introduction of a trocar, removal of enough of the contents of the sac to allow it to be drawn into the incision and fixed there by two long pins passed through it at the level of the upper and lower ends of the incision and resting transversely upon the skin.
3. Incision of the sac between the pins, and removal of its remaining contents.
4. Introduction of the hand into the sac, and determination of the presence or absence of adhesions. If adhesions to the movable viscera cannot be recognized positively in this manner, they can be *de visu* by drawing the sac partially out through the incision until the adhesions come into view, or by the conjoined use of the steel sound in the usual manner.
5. If no adhesions exist a complete ovariotomy is made; if adhesions of any strength exist the free portion of the sac is excised, and the edge of the remainder stitched to a portion of the sides of the abdominal incision so as to leave this portion of the sac in the shape of a pouch with an open mouth through which one or more drainage tubes are introduced; the remainder of the abdominal incision is closed in the usual manner.

If adhesions exist at widely distant points the intermediate portion of the sac is withdrawn and excised, thus leaving two or more separate pouches instead of a single one. If the sac is firmly adherent along the line of the abdominal incision, advantage should be taken of the fact to complete the operation without opening the peritoneal cavity by pinching

¹ Loc. cit. p. 65.

up the non-adherent portions and inverting them, if possible, through the incision.

In multilocular cysts each successive sac may be broken into and emptied through the first, as Mr. Wells recommends for tapping during an ovariotomy, and as Dr. Thomas¹ practised in a case his treatment of which combines most of the procedures I have here urged. This case, in fact, is such a notable example of the value and innocuity of these procedures (although Dr. Thomas drew a different inference) that I cannot do better than quote it in their support, and, with all deference, appeal from his judgment of 1875 to his judgment of 1879. He says:—

“I made an abdominal incision, to remove a cyst, and upon tapping found its contents so thick and contained in so many sacs, that I had to incise the main sac and introduce my hand to empty them. The tumour was found so firmly adherent to the liver, large intestines, and parts adjacent to the large blood-vessels on the spine, that its removal was entirely impossible. I therefore evacuated all the cysts, sewed the cyst-walls to those of the abdomen, closed the abdominal wound in part, and afterwards used antiseptic injections and drainage. The patient died on the twenty-first day, of pneumonia. Had I not done this, what other resource would have been open to me by which to give the patient even the smallest chance for life?”

He could scarcely have done better under any circumstances, for he practically saved his patient's life, and the case deserves to be placed with the four successful ones under somewhat similar conditions, quoted above from Mr. Wells's table of incompletely or abandoned ovariotomies. He secured his patient from the three great dangers of shock, peritonitis, and septicaemia. The pneumonia which killed her might have followed any operation, or might even have been entirely independent of it. I do not see how any treatment could have been more in accordance with the best surgical principles, unless possibly in the one detail of discovering the adhesions from within the sac, instead of from the outside, as I presume was done. He did no injury to the peritoneum, he caused no bleeding within its cavity, and he provided for a permanent cure by draining the sac and keeping it aseptic.

Such are the advantages of permanent drainage. What are its disadvantages? The objections urged against drainage through the vagina, notwithstanding its success, are not applicable to drainage through the abdominal wall, for they are objections of detail based upon operative difficulties which disappear in the presence of free access to the cyst. Kiwisch, quoted by Dr. Thomas, says of vaginal drainage: “In our opinion it is only of use in moderately large simple cysts, because in very large cysts the extensive decomposition must be very exhausting to the system, and compound cysts do not allow of a proper shrivelling of the open sac, as we experienced in a fatal case, in which two cysts were in juxtaposition, and only one could be punctured.” In operating through

¹ Loc. cit. p. 712.

the vagina the surgeon can do nothing but tap the portion of the tumour which presents, and he is helpless in the presence of multilocular or compound cysts; in operating through the abdomen the entire tumour is within his control, and if there are numerous cysts they can be successively emptied into the first, and the obstacle to the shrivelling of the sac removed. The drain of "extensive decomposition" is prevented by the excision of as much of the sac as can be drawn out through the wound, by more thorough drainage, and by antiseptics. The complete evacuation of the sac is followed immediately not only by collapse of its sides, but by a shrinking which greatly reduces its superficies, and if it is kept empty and unirritated by the products of putrefaction, the patient is exposed to absolutely no morbid influence except such as may arise from the primary incision. The results of the drainage, under antiseptic precautions, of large joints and cold abscesses in immediate proximity to the peritoneum, as well as elsewhere, are an assurance of the safety of similar drainage of an ovarian cyst, and the retardation of complete recovery by the persistence, for a longer or shorter time, of a fistulous opening, is a small price to pay for the greater freedom from risk.

I can foresee only two other possible difficulties. They are: (1) Hemorrhage into the sac from vessels of its wall, which have become distended in consequence of the withdrawal of pressure; (2) obstruction of the intestines by the establishment of fixed relations between them and the anterior abdominal wall. So few sacs are vascular, that hemorrhage is not likely to occur; and if it should take place it could be readily controlled, and, under antiseptic treatment, it would be free from its principal danger—that of absorption of the putrefied blood. Obstruction of the intestines would undoubtedly occur in a certain proportion of cases, but whether that proportion would be greater than under the present methods, experience alone can determine. That experience I cannot expect my own practice to furnish. If the facts here collected, and the arguments drawn from them, shall induce those whose opportunities are so much greater to give these suggestions a trial, my object will have been attained, and, I firmly believe, many lives will be saved thereby.

In conclusion, the different points I have sought to make may be formulated as follows:—

1. The mortality of ovariotomy, in cases complicated by adhesions, is at the rate of almost 1 death in every 3 such cases; and is about twice as great as the mortality in cases not thus complicated.

2. The principal causes of this mortality are shock, peritonitis, and septicæmia, and may be attributed, in most cases, directly to rupture of the adhesions.

3. This rate is not diminished by increased experience on the part of the operator, and there is no reason to expect that the methods now in use will ever yield a better result.

4. Permanent drainage of the sac offers a means of cure without rupture of the adhesions, and its mortality, when heretofore employed as a last resort in the so-called incompletely ovariectomies, has been 1 in 3 (Wells), or 1 in 6 (Péan).

5. The success of vaginal drainage proves that drainage of a sac is not in itself as dangerous as ovariectomy even under conditions most favourable to the latter.

6. Abdominal drainage has a much larger field of application than vaginal drainage, and is free from the principal dangers of, and objections to, the latter.

7. Adherent cysts, single or multilocular, should, therefore, be treated by permanent drainage through the abdominal wall, and not by ovariectomy.

8. Adherent cysts combined with solid tumours should, whenever possible, be treated by a combination of ovariectomy with drainage; the tumour being removed, and the adherent portion of the cyst being drained.

9. The character of a cyst, the presence or absence of adhesions, can be determined by examination by the hand introduced into the sac.

10. Therefore, the second step in every proposed ovariectomy should be to fix the cyst in the abdominal wound, open it, introduce the hand, and explore it from within. Upon the facts disclosed by that exploration the surgeon must decide whether to complete the ovariectomy or to substitute abdominal drainage. In cases in which this method of exploration is not effectual it must be supplemented by examination outside the sac, but this examination must be a real one, and not a successive rupture of adhesions as they are encountered.

11. Full antiseptic precautions must be taken during this exploration, and continued if drainage is established.

Since writing the above, I have examined, with reference to the results of partial removal of the sac and drainage of the remaining portion, Péan's statistics, published in his *Leçons de Clinique Chirurgicale*, Paris, 1876. These results are so notable a confirmation of the opinion expressed above concerning the value of this method, and are the outcome of so large an experience, that it has seemed best not to attempt to embody them in the text of the paper, but to add them as an appendix, in the hope that more direct attention may thus be drawn to them.

The statistics comprise 221 operations for the removal of tumours from the peritoneal cavity through an abdominal incision. Of these, 190 were ovariectomies (speaking broadly), and 25 were for the removal of fibromata or fibro-cystic tumours of the uterus. In 29 cases, where the sac was extensively adherent, or where there was no pedicle, the adherent portion of the sac, or the pouch left by enucleation (cases of cyst or tumour of the broad ligament), was fixed in the abdominal incision, and treated by permanent drainage.

Of these 29 cases 5 died, a mortality of only 17 per cent., the rest were cured, the fistulous opening persisting in some cases for months or even years; 14 were cysts of the broad ligament, and gave 11 recoveries and 3 deaths. Of the remaining 15, 12 of which were real ovarian cysts, 2 fibro-cystic tumours of the uterus, and 1 an hydatid cyst attached to the vesico-uterine cul-de-sac, 13 were cured and 2 died.

The details of the method employed by Péan may be gathered from the description of the treatment of the two fibro-cystic tumours of the uterus on page 703: "The non-adherent upper portion of the sac having been excised, the edge of the remainder, which formed a sort of purse, was sutured to the edges of the abdominal wound. The rest of the abdominal wound was closed in the usual manner, and two rubber tubes carried to the bottom of the sac to allow injections and the free escape of pus."

Such results as this should make a surgeon hope that, if he is to encounter any adhesions, they may be strong enough to forbid complete removal, and force him to employ drainage.

It is worthy of notice, too, that the cases which, in Péan's opinion, called for this modification of the operation were about 1 in 7 of all cases operated on.

ARTICLE VII.

THE TOPICAL USES OF ERGOT. By WILLIAM C. DABNEY, M.D.,
of Charlottesville, Virginia.

In a recent number of the *Journal de Thérapeutique*, M. Planat, of Nice, called attention to the use of ergot in acute ophthalmia. No doubt other physicians have used this agent in affections of the conjunctiva and other mucous membranes, but it is surprising that medical literature should contain so little on the subject. I propose in the present paper to consider some of the topical uses of ergot and the circumstances under which it seems especially applicable.

The influence of ergot in causing contraction of the bloodvessels is too well known to need any comment, and I shall therefore say nothing as to its physiological action. M. Planat states that he has found ergotin to act equally well in acute and chronic ophthalmia. I have used it but little in cases of *acute* conjunctivitis, and was not altogether pleased with its action under such circumstances. It seemed to increase the irritation rather than to diminish it. In those cases, however, where the bloodvessels were enlarged and tortuous, excellent results were obtained. I recall very distinctly the case of a little girl about ten years of age who had been suffering for a week with conjunctivitis before I saw her. When she came to my office there was quite a free discharge of muco-pus from

the eyes, and the bloodvessels of the conjunctiva were considerably enlarged, the membrane itself being somewhat thickened and opaque. The eyes were not painful, and there was very little, if any, intolerance of light. The treatment directed was the frequent cleansing of the eye with warm water and the instillation after each washing of a few drops of the following solution : Ergot (solid extract), grs. x; glycerine, fʒj; water, to make, fʒj. M. There was a very manifest improvement in a few hours, and in three days the eyes were well.

When there is much intolerance of light, and the eyes are very painful, the results have been much less satisfactory. I have had no experience with ergot in cases of granular conjunctivitis, but it is probable that it would prove serviceable in such cases, and, indeed, I believe it has been tried with benefit. (As I am spending the winter at San Diego, California, for my health, I am cut off from my books and journals, and have not access to the literature of the subject.)

In cases of *pterygium* I have used it with decided benefit. A solution of the strength mentioned above was applied three times a day, and the growth was checked thereby. In none of the cases where I have used it thus far has it exerted a curative action, but it is highly probable that if persisted in the bloodvessels supplying the pterygium would become so much contracted as to cause an actual diminution in the size of the growth.

In *pharyngitis* I have obtained excellent results from the application of a solution of Squibb's solid extract of ergot to the throat; indeed, no other remedy has given anything like such satisfactory results in my hands. Just as in ophthalmia, the remedy seems to act much better in chronic than in acute cases. It is especially applicable when the bloodvessels of the pharynx are enlarged and tortuous, and when the secretion is not very great. In those cases where the mucous membrane is thickened, it acts much more slowly, and in acute cases it possesses no advantages over other remedies. In affections of the pharynx and in other cases to be mentioned hereafter a combination of ergotine with tincture of iodine, as in the following formula, is especially efficacious: Ergotine, grs. xx; tinct. iodine, fʒj; glycerine, to make, fʒj. M. To be applied to the pharynx freely twice a day with a camel's-hair brush.

In *hypertrophy* of the *tonsils*, which is so often an accompaniment of chronic pharyngitis, the same solution applied to the glands two or three times a day gives excellent results.

About two years ago a young lady of Brooklyn, New York, 15 years of age, who had been suffering for months with pharyngitis and enlargement of the tonsils came under my care. The mucous membrane of the pharynx and the soft palate was considerably thickened, and there was quite a free formation of thick yellow muco-purulent fluid. The tonsils were greatly hypertrophied. Her general health had suffered a good deal, and she had been taking tonics, but with very little benefit. Quinia, iron, and arsenic

were continued, however, and in addition her throat was brushed freely with the solution of ergot and iodine in glycerine twice a day. In two months' time her throat was well and her general health had greatly improved. In this case chlorate of potash, alum, zinc, and a solution of nitrate of silver had been faithfully tried before without benefit.

Within the past ten days I have had the same mixture applied to the throat of a gentleman whose pharynx was greatly congested and had been so for weeks. The bloodvessels were enlarged and tortuous, but there was very little secretion. The mixture was applied with a brush twice a day, and in four days the congestion had subsided almost entirely.

It is probable that nasal catarrh would be benefited by ergot, locally applied. The great trouble in these cases has been that remedies applied with the nasal douche have remained in contact with the congested Schneiderian membrane too short a time to do any good. About two years ago Dr. George Catti proposed the use of gelatine bougies, which were to be inserted through the anterior nares and then allowed to soften and flow out by the posterior nares. These bougies could be medicated with any agent which it was thought desirable to use, and in a note appended to the translation of Catti's paper in the *Virginia Medical Monthly* I suggested the use of ergot in this way. I have never tried the bougies myself, however. In one case of catarrh, when the inflammation was seated near the posterior nares, I applied a solution of ergot and iodine by means of the post-nasal syringe, but the result of the treatment is not known. A solution of ergot in glycerine may also be applied to the nasal mucous membrane by means of a camel's-hair pencil, but I cannot say that I have had satisfactory results from any mode of application which I have tried thus far. If the medicine be applied to the Schneiderian membrane in any way, the iodine should not be added to the mixture at all, or else only in very small quantity.

It is unnecessary to say anything as to the use of this agent in *hemorrhoids*, as it is mentioned now in nearly all the text-books on therapeutics, and is in common use.

It seems almost needless also to say anything as to its use in *metritis* and *endo-metritis*. But, although it is mentioned now in nearly all the works on gynaecology, its value does not seem to be recognized by the majority of general practitioners.

It appears to be especially applicable in *cervical metritis*. The manner in which it should be applied depends on the season of the year and the temperature. When the weather is sufficiently cool suppositories are preferable, but in warm weather it is difficult to handle them and keep them from melting. The addition of extract of belladonna increases the efficacy of the ergot, and also tends to relieve any pain which may be present. The following formula I have found serviceable : Ergotine (or solid extract of ergot), grs. xx; extract of belladonna, grs. ij; cocoa butter, q. s. M

Make into six suppositories and insert into the vagina every night after using the hot douche.

In November, 1876, I saw a woman, 40 years of age, who had been suffering for several years with the usual symptoms of cervical metritis and prolapsus. Upon examination the neck was found to be enormously hypertrophied, hard and nodulated; so great indeed was the enlargement and firmness of the part that one of the physicians who saw the case considered it due to cancer. The os was patulous and the sound penetrated a distance of about $4\frac{1}{2}$ inches. On careful examination through the vagina and abdominal walls, I could detect but little enlargement of the body of the uterus. At the menstrual epochs the flow was very profuse, and in the intervals there was a considerable discharge of tough mucus mixed with pus. The woman was greatly debilitated, and confined to her bed most of the time. Quinia, iron, and arsenic were advised, together with a generous diet. I commenced also the administration of ergot by the mouth, but had to desist in a day or two on account of the nausea which it produced. The use of the suppositories of ergot and belladonna was then commenced, and continued steadily except at the menstrual periods until February, 1877. She had then improved very greatly, and there was a decided diminution in the size of the neck of the uterus. The suppositories were omitted for a month and then resumed. I did not see her again until the following November just one year after the treatment was commenced. The cervix was then of natural size and the menstrual discharge also natural in all respects. The treatment in this case was continued with only a month's intermission for a year, but the results were certainly most gratifying. I should have stated, however, that there was still a *slight* mucous discharge during the interval between the menstrual periods.

In warm weather a solution of ergotine and extract of belladonna in glycerine and water may be used in place of the suppositories, as in the following formula: Ergotine (or Squibb's solid extract), 5ss ; extract of belladonna, grs. vj ; water and glycerine, $\text{aa f} \frac{1}{2} \text{iv}$. M.

A pledget of cotton is to be saturated with this solution, and inserted into the vagina at bed-time after the hot douche. The cotton should, of course, be removed in the morning.

It has been proposed to paint a solution of ergot on the os and cervix with a camel's-hair pencil, and favourable reports of this mode of treatment have been published. So far as my own experience enables me to judge those cases where there is a copious discharge of mucus or pus are much less amenable to treatment than others, and this is probably due to the fact that the medicine remains in contact with the diseased surface such a short time before it is washed off. And I would call attention just here to the advantages of glycerine over water as a *vehicle* when ergot is applied to mucous membranes where it is liable to be speedily washed off. The tenacious properties of glycerine keep the remedy longer in contact with the diseased surface, and in addition to this the glycerine itself is, as Dr. Marion Sims long ago pointed out, of decided value in reducing some of these chronic inflammatory engorgements. When ergot is applied to the

eye, however, only sufficient glycerine should be added to prevent the mixture from spoiling.

In addition to the topical application of ergot to mucous membranes it is highly probable that it will be found of service when applied to the skin over points of chronic inflammation. I say it is *probable*, because so far as I know no observations on this point have as yet been made, and my own are too few in number to lead me to any definite conclusions. I have used a solution of ergot and iodine in glycerine in several cases of glandular enlargement, but the result was not encouraging. In chronic inflammation of the joints I have had no opportunity as yet to try this mode of treatment, nor have I used it for any of the neoplasms (except internal fibroids, hypodermically, and in the form of vaginal suppositories), the growth of which it might check. When applied to the skin with a view to its absorption the vehicle should be either glycerine or one of the oils. An oleate would be a convenient form for application, and morphia could be added to this if it was thought advisable. Certain *indolent ulcers* in which the bloodvessels were enlarged would probably be benefited also by the application of ergot either with or without iodine. I cannot speak from experience, however, on this point.

I do not for a moment suppose that ergot administered in this way can take the place of its administration hypodermically or by the mouth, but each method has its special field of applicability, and I am convinced that the value of the agent when locally applied has not been duly appreciated by many practitioners. Hypodermic injections are painful when ergot is the agent administered, and every physician who has given the remedy at all has doubtless observed how nauseous it becomes to the patient after a few days when administered by the mouth; hence in such cases as neoplasms or chronic inflammations of parts adjacent to the skin it would seem advisable to practise this method of administration, or at all events to resort to it when the other avenues are closed.

ARTICLE VIII.

NOTES ON INTRA-OCULAR LESIONS PRODUCED BY SUNSTROKE. By F. C. HOTZ, M.D., Ophthalmic Surgeon to the Illinois Charitable Eye and Ear Infirmary, Chicago.

AMONG a great number of cases of atrophy of the optic nerve we occasionally meet with a patient who traces the beginning of his eye trouble back to an attack of sunstroke. He is positive in his assertion that previous to that accident his sight was perfect, but began to fail sooner or later after it. The ophthalmoscope reveals a white or bluish-white papilla, with thin arteries and often pigmented outlines.

The etiological connection between sunstroke and atrophy of the optic nerve in such cases is unquestionable; and the appearance of the atrophic disk would indicate that the atrophy was the result of optic neuritis.

It is therefore remarkable that the ophthalmological literature has given so little attention to defects of sight induced by sunstroke; it is strange that we can scarcely find an allusion to sunstroke as a remote cause of neuro-retinitis, atrophy of the optic nerve, and other intra-ocular lesions.

Most of the text-books on diseases of the eye (Wells, Carter, Mackenzie, Walton, Arlt, Stellwag, Schweigger, etc.) give us no information whatever about the possible effects of sunstroke upon the eye.

In that excellent and carefully compiled *Handbuch der Gesammten Augenheilkunde*, I could find only this vague allusion:¹ "Cases are also reported in which similar defects of sight are said to have been induced by the effect of the scorching heat of the tropical sun."

Macnamara² is the only writer who speaks more positively on the subject:—

"It is not an uncommon thing to meet with people in India suffering from headache induced by over-exposure to the sun; the papilla will often be found intensely congested under these circumstances, the capillaries of the retina being somewhat hyperæmic also. The glare of the tropical sun seems to overstimulate the retina, and it becomes congested and swollen; if the exciting cause continues in operation, the irritation is propagated to the brain, and headache and irritative fever ensues.

"It seems to me that irritation, under these circumstances, begins in the retina, because I have frequently found in my own case, that a pair of coloured glasses has saved me, when exposed to a tropical sun, from the distress produced by the glare, and subsequently headache, which one so frequently experiences unless the eyes are thus guarded."

This view does not seem to me to give a satisfactory explanation of the causative relation between sunstroke and eye trouble. And, certainly, the following observations which I gathered during the past year do not support it.

CASE I. Heatstroke followed by Partial Paralysis of Left Arm and Optic Neuritis of Right Eye.—Mr. Adolf St., aged 29, manufacturer, was prostrated by the excessive heat in July, 1878. Though he was not exposed to the direct rays of the sun, he became dizzy, and fell down. When he recovered he had lost the use of his left arm, and suffered from violent frontal headache. To his right eye the air seemed to be in a wavering motion. Two months later the headache ceased, but sight of right eye became very dim.

Examination on August 22d, 1878. L. E., V = $\frac{2}{3}$ o, emmetropic; fundus normal. R. E., fingers at six feet; hemianopsia, the temporal half of visual field being completely obscured. Media clear; the nasal half of disk swollen and red, so much so that its boundary cannot be discovered. Around the still distinct temporal outline a narrow crescent of choroidal atrophy.

Treatment: Heurteloup; and infusion of fol. jaborandi.

¹ Leber, on Retrobulbar Neuritis resulting in Partial Atrophy, vol. v., p. 837.

² Manual of Diseases of the Eye, 3d ed., 1878, p. 437.

28th. The jaborandi produced profuse perspiration, beginning about fifteen minutes after he took the infusion, and lasting over one hour. Optic disk is paler. V the same. Ordered iodide of potassium, 1.5 *pro die*.

Sept. 11. Retina and optic disk appeared normal in colour. Perception restored in the temporal half of the field of vision. V=fingers at fifteen feet.

24th. Crescent round the outer side of optic disk seems broader. V= $\frac{2}{7} \frac{0}{0}$, with — 18 $\frac{2}{7} \frac{0}{0}$.

Oct. 6. V = $\frac{2}{7} \frac{0}{0}$, with — 40 $\frac{2}{7} \frac{0}{0}$.

The same result was obtained two months later.

CASE II. *Heatstroke; Optic Neuritis of Right Eye.*—Mrs. Maria M—, aged 41 years, housemaid, of Oak Park. In July, while ironing in a hot kitchen, she was overpowered by the heat, and afterwards suffered from the most violent headache, attended with fever, lasting about three weeks. Since then she noticed a mist before her right eye. Sight of both eyes had always been perfect.

Examination September 13, 1878. L. E. normal; V = $\frac{2}{7} \frac{0}{0}$. R. E., V = $\frac{2}{7} \frac{0}{0}$; media transparent; papilla opaque, and so red that it cannot be distinguished from the surrounding retina. Two leeches were applied to right temple; patient ordered to remain in a darkened room for one week, and to take tinctura rhamnus frangulae.

20th. Papilla is paler; its boundary visible; V = $\frac{2}{3} \frac{0}{0}$.

Oct. 2. Papilla clear, vessels normal; its outlines well defined; V = $\frac{2}{2} \frac{0}{0}$.

CASE III. *Slight Attack of Sunstroke; Optic Neuritis of Right Eye.*—Mr. John L—, aged 35 years, travelling agent, has always been in good health, never had syphilis, and had never noticed any difference in the sight of his eyes. On one of the hottest days in July, while going about to visit his customers in town, he was overcome by the heat, became dizzy and faint, and fell down on the street. He was taken home in a carriage, and was confined to his bed for three days with severe headache. On the 29th of July he observed the eclipse without protecting his eyes by smoked glasses. Three days after, he noticed that all objects to his right side appeared as though they were wrapped in a mist. He consulted me on the evening of the 29th of September. As I expected to see the patient again on the following day at my office, where I could better test his sight, I deferred the further examination of the disturbance of vision, and only ascertained that on closing the left eye and looking with the right at my fingers he could see the thumb, index, and middle fingers distinctly, while the ring and little fingers appeared very dim. The ophthalmoscope revealed transparent media, a hyperæmic swollen papilla, with indistinct outlines, and a grayish mist cast over a large portion of the nasal half of the retina.

I regret to give the history of this case as incomplete as it is; but the patient did not return.

CASE IV. *Sunstroke followed by Neuro-retinitis in both Eyes.*—Thomas Murphy, aged 48 years, labourer, of Jacksonville, Ill., was admitted to the Illinois Charitable Eye and Ear Infirmary on the 7th of November, 1878. In July, after working in the sun and drinking freely, he suddenly became dizzy, and lost the sight in the lower halves of fields of vision. He says he could see distinctly straight ahead or above him, but could hardly see the steps when going down stairs. Gradually his sight improved to a certain extent.

On examination R. E. V = $\frac{2}{5}0$, L. E. V = $\frac{2}{10}0$; slight epithelial opacities in both corneæ, of which patient could give no information. Pupils very small, but active. Optic disks very red, slightly swollen; boundaries quite indistinct; veins very full; arteries about normal.

The treatment was begun with cathartic pills, and then potassic iodide and bromide was given. Under this treatment the sight improved so that on December 9th we found R. E. V = $\frac{2}{5}0$, L. E. V = $\frac{2}{5}0$; disks more distinct and less red; and, when the patient was discharged, March 3, 1879, the vision of right eye was $\frac{2}{2}0$, that of the left eye $\frac{2}{3}0$.

To these cases I will add one which was observed in 1873, and another one which was under the care of Dr. W. T. Montgomery, of this city, who kindly furnished me the notes of his case.

CASE V. Optic Neuritis of Left Eye; History of Sunstroke.—Mr. Thomas S. H., aged 32, merchant. Examined on August 24, 1873. Was sunstruck in July of previous year; since then he was troubled with the perception of an apparent wavering motion of the air, and the sight of left eye gradually grew very dim. R. E. V $\frac{2}{2}0$, emmetropic and normal fundus. L. E. fingers at 10 feet; disk very red, streaked, and swollen; its outlines indistinct; surrounding retina cloudy. Heurteloup to left temple. Bichloride of mercury 0.006 three times daily.

Aug. 31. L. E. V = $\frac{2}{3}0$. Another Heurteloup.

Sept. 15. L. E. V = $\frac{2}{2}0$. Retina clear; disk slightly flushed, but its boundary well defined.

CASE VI. Neuro-retinitis following Heatstroke.—Mary J. B., aged 34, farmer's wife, consulted Dr. Montgomery on account of eye trouble September 17, 1878. Patient stated that she had weak eyes for ten years, and had been troubled with motes floating before them. Vision good until about six weeks ago. The weather at that time was very hot, and she was very busy cooking for harvest labourers, and became overheated. Did not become unconscious from the heat, but was very much oppressed by it, and this oppression was soon followed by severe headache, and the sight of left eye began to fail. Patient's general condition fair. Still complains of headache. R. E. V = $\frac{2}{2}0$, L. E. V = perception of light.

Ophthalmoscope, right eye, general hyperæmia of fundus; left eye, papilla swollen, outline of disk very indistinct; general cloudiness of whole fundus, but most marked in region of disk and outer portion of field.

The patient could not remain in city for treatment, and was only examined once. Prescribed potassium and sodium bromide aa gr. x three times daily. A succession of blisters to temple and behind ear, rest in a dark room, and bowels to be kept lax.

Husband wrote November 1st that the treatment had been faithfully followed, and that patient had improved very much. Heard nothing more from her.

These observations show a most significant similarity. The patients were exposed to excessive heat until they succumbed to its noxious effect. After recovery from the immediate shock, they suffered from a violent headache for several weeks, and sooner or latter their eyesight began to fail; and in all cases optic neuritis and peri-neuritis was found as the pathological condition of the eyes so affected.

These clinical facts, I think, show pretty conclusively that the neuritis

is a secondary affection, resulting from a primary lesion produced by the heat within the cranial cavity. And I believe, with our present knowledge of the anatomy of the optic nerve, it is not difficult to indicate the way by which the intra-cranial affection is propagated to the intra-ocular portion of the optic nerve.

Among the few things pathologists agree upon in regard to the morbid changes which sun or heat strokes induce in the human body, are the facts that we generally find a marked congestion of the sinuses and nerves; sometimes a sanguineous effusion between dura mater and cranium; a certain quantity of serum at the base of the brain; and the gray substance more or less hyperæmic.

On the other hand, Schwalbe has established the fact (confirmed by other investigators) that the sheaths which envelop the intra-orbital portion of the optic nerve must anatomically be considered as direct continuations of the meninges. The external neurilemma of the optic nerve is a part of the dura mater and arachnoid, the internal neurilemma a part of the pia mater, and the space between these two sheaths—the intervaginal space—is in open communication with the arachnoidal space of the brain. Ever since these anatomical facts have been clearly understood, it has been pretty generally conceded that they afford a satisfactory explanation for clinical observations, which associate optic neuritis frequently with intra-cranial diseases. It was thought that disturbances of the circulation in the meninges could be communicated to the sheaths of the optic nerve on account of their contiguity.

Upon this basis, I think, we can find a correct interpretation of the clinical features of the above cases. We may presume the excessive heat caused hyperæmia of the meninges, congestion of the sinuses; in some cases, perhaps, also a serous exudation at the base of the brain.

The severe headache that most of the patients were suffering from, a headache lasting from two to three weeks, is an evident sign of a disturbed circulation in the cranial cavity. This irritation was communicated to the sheaths of the optic nerve, and produced ultimately the ophthalmoscopic symptoms of peri-neuritis and neuritis.

It does not militate against this view that in the majority of cases the head symptoms had ceased before the patient noticed any disturbance of sight. For it does not prove that during the period of headache the optic nerves were not affected. We know that a certain degree of congestion of the optic nerve may exist without any appreciable impairment of vision; we know that peri-neuritis interferes but slightly with the nutrition and function of nerves; while in *neuritis* the nerve-substance suffers material changes in structure and function. In two of the cases on record (Nos. 4 and 5) the sight was impaired directly after a severe sunstroke; in the other four cases (Nos. 1, 2, 3, and 6) the visual defect supervened after a period of headache.

Patients 1, 2, and 6 had an attack of heat-stroke, and No. 3 a slight attack of sunstroke, while Nos. 4 and 5 had a severe attack of sunstroke.

It will be noticed that the severity of the attack had an evident bearing upon the earlier or later occurrence of the eye trouble. The severer the sunstroke the sooner vision was disturbed.

I am therefore inclined to think that in the severe cases the graver disturbance in the brain at once propagated the graver form of disturbance, *neuritis*, to the optic nerve, while the lighter attacks first gave rise to a *perineuritis*, which lasted a few weeks without disturbing the functions of the optic nerves; but ultimately the inflammation extended into the substance of the nerve, developing optic neuritis, which all the cases presented at the time of examination. If the limited number of my observations would permit me to form an opinion in regard to the prognosis of this solar optic neuritis, I would say, judging from the good results obtained in all cases which were under treatment, that the disease is quite amenable to treatment.

It will be manifest that my opinion of the relation between the optic nerve affection and the head trouble is essentially different from the view advanced by Macnamara. I may say with Dr. Allbutt:¹ "Macnamara supposes that the cerebral irritation is due to advance of the solar irritation from the retina upwards; my view would be rather the reverse."

My observations certainly do not sustain Macnamara's view. The strongest argument against him is the fact that heatstroke and sunstroke produced identical symptoms. It so happened that among the six cases of neuro-retinitis three were the result of sunstroke and three were due to heatstroke. Inasmuch as these latter cases were not exposed to the glare of the sun, the retina could not be the primary seat of solar irritation. Again, the effect of glaring light upon the retina shows itself most particularly at the most sensitive part of this tunic; the overstimulation causes a dulness of the perceptive power of the whole retina, but the impairment is especially marked in the region of the yellow spot. Such patients complain of scotomata; but none of our patients noticed anything of this sort.² It will be remembered that the pathological changes observed in the fundus oculi have been limited to the area of the papilla, or, where they extended beyond it, the disturbance of the retinal tissue was very slight compared with the change of the optic disk. We can understand this, if we consider the ocular trouble as being propagated from the brain to the optic nerve. But it is very improbable that an irritation of the retina strong enough to produce secondary disturbances in the optic

¹ Use of Ophthalmoscope in Diseases of Nervous System, 1871, p. 99.

² The only patient who exhibited anything like a scotoma is the one (Case III.) who exposed his eyes to the glare of the sunlight, in observing the eclipse with the unprotected eye. The extensive obscuration of his visual field was due to the effect of the glare; and in this case alone we find the retina more extensively affected than in all other cases.

nerve and brain should cause scarcely any change in the structure and appearance of the primary seat of irritation.

Optic neuritis, however, does not seem to be the only secondary affection of the eye induced by sunstroke. The severest attacks may be followed by a high degree of choroiditis exudativa, with subsequent detachment of the retina, as the following observation will show.

CASE VII. *Insolation followed by Severe Headache; Detachment of Retina in Left Eye.*—Mr. John W., aged 32 years, native of Holland, labourer, was admitted to the Illinois Charitable Eye and Ear Infirmary, on July 16, 1878, with the following history. On July 8th, while working in the hot sun on the roof of a building, he was seized with severe frontal headache, which continued until in the night of July 12th; then it ceased. Upon rising in the morning of next day, he, for the first time, discovered that he had almost entirely lost the sight of his left eye, only a little perception remaining in the upper region of the visual field; but this also left him by noon of the same day.

Ophthalmoscopic examination: Cornea, iris and lens were normal. Vitreous humour somewhat cloudy; upper half of retina detached in three bladder-like folds, one above and one on either side. Lower half of retina still attached, but quite opaque.—T. Patient was given iodide and bromide of potassium, 0.5 grams of each; and pressure bandage was applied to the eye.

17th. Eye is painful and very sensitive to pressure; slight perception of light. Pupil is dilated by atropia; the nasal fold of the detached retina is much smaller.

18th. Pupil still dilated; iris markedly discoloured, of a greenish cast (right iris being light blue). Vitreous humour is more clouded, and filled with numerous small black and floating bodies like coal-dust.

23d. Has had no pain since last date. Iris less discoloured; vitreous clearer; retina re-attached, except at the lower nasal portion; can count fingers at a distance of eight feet.

30th. Vitreous clear; but detachments of retina more extensive again, involving the whole lower half.

Remarks.—The unusual severity of the headache, attended by fever, makes it very probable that the insolation has caused an inflammation of the meninges, and a serous exudation over some portion of the left half of the brain. Through the intervaginal space of the optic nerve the inflammatory process reached the eyeball, involving its uveal tract. The cloudiness of the vitreous humour, the tenderness of the globe, the subsequent discoloration of the iris, are evident symptoms of a *choroiditis exudativa* which led to the detachment of the retina. This explanation is founded upon the clinical experience that if, in the course of acute inflammation of the meninges, the eyeball becomes involved, the inflammation is usually propagated to the uveal tract, and not to the retina. That this propagation takes place through the agency of the intervaginal space is very plausible, if we consider the anatomical relation of its ocular terminus to the choroid. Schwalbe gives the following description of it:¹—

¹ Graefe & Saemisch, Handbuch der Ges. Augenheilkunde, vol. i. p. 330.

"The fibres of the external sheath simply pass over into the external two-thirds of the sclerotica; external neurilemma of the optic nerve and sclerotica are continuous. The inner neurilemma, or pial sheath, becomes firmly attached to the surface of the optic nerve, which it accompanies to the vicinity of the choroid; here the larger portion of its fibres is blended with the inner third of the sclerotica; only a few of them can be traced into the texture of the choroid, which at this place is firmly united with the sclerotica. The intervaginal space gradually tapering off, advances between both sheaths to the closest proximity of the choroid, from which it is separated only by the thin layer of sclerotica, which is identical with the pial sheath of the optic nerve."

From the close proximity of the terminus of the inter-vaginal space to the choroid, we can well understand that this highly vascular tunic readily responds to the irritating influence of inflammatory products in the inter-vaginal space; and therefore I infer that in this way the inflammation was started in the choroid, which resulted in a serous transudation between it and the retina.

In support of this view I may be permitted to record another case of detachment of the retina, in which the intra-ocular affection must be attributed to a primary lesion of the meninges.

CASE VIII. *Fall upon Head; Detachment of Retina two weeks afterwards.*—Mr. J. H., aged 60 years, had had intermittent fever. For several years past his sight had been slightly impaired. In January he fell down a stairway, striking the ground with his left parietal bone. He did not become unconscious, but the blow stunned him to such a degree that he was obliged to sit still for some time before he was able to get up and walk. For three or four days he had a violent pain over the left side of his head; but he is positive that the sight of the left eye was still as good as before the accident. After one week, however, he noticed that perpendicular lines (such as the edges of door-posts) appeared as if they were broken in three pieces, the middle piece being markedly displaced to the left. During the second week the sight of the left eye began to fail, and its visual field became contracted. The obscuration began in the inferior nasal section of the field, gradually extending upwards, until after three or four weeks (latter part of February) the visual field was abolished with the exception of a very narrow segment in the lower temporal section.

I examined his eyes on March 23d. R. E. V = $\frac{2}{4}0$; emmetropia; incipient cataract; several of the opaque spokes reaching into the central part of the lens; fundus normal.

L. E. No central vision; only a very limited area of peripheric vision in lower temporal quadrant. Incipient cataract; whole upper half of retina detached, hanging down in a large oscillating curtain, its lower edge running obliquely from above downwards and outwards. Papilla red, but well defined: vessels normal.

Tension not noticeably diminished, but eye slightly sensitive to pressure.

Remarks.—The facts in this case are clear. An old man, whose sight has been slightly impaired by incipient cataract, receives an injury of his head, which was followed by a certain degree of traumatic meningitis of the left side. The sight of the left eye was not disturbed immediately after the injury. After the first week he noticed metamorphopsia, and two weeks later the obscuration characteristic of detachment of the retina began

slowly to creep over the left eye. From these facts we can infer that the fall upon the head certainly had not injured the eye ; for the disturbance of its functions came on neither immediately nor suddenly, as it should had there been a direct traumatic lesion of the eye.

The slow and gradual growth of the detachment points to a gradual accumulation of serous fluid between retina and choroid, due to the gradual rise of an inflammatory action in the choroid. The late development of this choroiditis, the serous character of its products speak decidedly against the supposition of its being traumatic inflammation. And all the symptoms explain themselves as soon as we suppose that the choroiditis was a secondary affection, propagated from the brain through the inter-vaginal space of the optic nerve in the manner described above in connection with the other case.

ARTICLE IX.

THE VALUE OF WARM WATER IN SURGERY. By A. H. GOELET, M.D.,
of New York.

THE following cases are reported in substantiation of the views advanced by Dr. Frank H. Hamilton in a recent article in the *Buffalo Medical and Surgical Journal* for April, 1879. While the report covers only a limited range of the usefulness of *warm water*, it will be of practical value to all interested in surgical dressings. The cases illustrate the value of the use of warm water in *erysipelas*, especially *traumatic*; *lacerated* and *contused wounds* in general, but especially those of the *scalp*, which are so prone to take on *erysipelas*, and those of *compound fractures*; *gunshot wounds*; and *traumatic gangrene*.

Warm water may be applied in two ways, viz., 1st, by means of the water bath, in which case the limb is submerged in water kept constantly at the same temperature (generally about 100° F.), disinfected when so desired, and changed as often as necessary (about twice a day will generally suffice) ; 2d, by means of hot fomentations, which consist of a layer of cotton batting, or two thicknesses of sheet lint, saturated with hot water (previously disinfected if so desired), applied closely and evenly to the part, and kept at an even temperature by a covering of oiled silk. In this case it will be necessary to re-wet the dressing about every two hours, and change it twice a day, or oftener in cases where there is profuse suppuration. In cases of *erysipelas* the dressing must extend a little beyond the limit of inflammation.

Cases of *Erysipelas*:

CASE 1. *Laceration over Left Eyebrow; Relative Value of Tr. Iodine and Hot Water.*—George M., aet. 14 years, was admitted to the Ninety-

ninth Street Reception Hospital March 26, 1874, with the above injury, produced by falling from a rock. The edges of the wound were brought together by three sutures strengthened with adhesive strips.

27th. Tissues around wound look oedematous and red; painted with tr. iodine; sutures not removed.

28th. The surface for some distance around the wound has an erysipelatous blush; sutures removed, surface painted with tr. iodine, and covered with *warm water* dressing (?). The same treatment was continued until the 31st, when erysipelas had extended over the whole face. Iodine discontinued, and hot fomentations *only* applied. The internal treatment consisted of carbonate of ammonia and camphor.

On the following day (April 1st) the erysipelas was beginning to subside, and on the 5th it had entirely disappeared.

CASE 2. *Comminuted Fracture of the Lower End of the Humerus; Slough over External Condyle detached under Warm Water Treatment; Subsequent Development of Erysipelas; Relative Value of Tr. Iodine and Hot Water.*—Wm. D., æt. 13 years, was admitted to Ninety-ninth Street Hospital February 19, 1875, with above injury, having been thrown from a wagon, and struck by the wheel of a locomotive.

March 3d. A bluish spot made its appearance over the external condyle, which in a few days looked gangrenous, and hot fomentations were applied.

On the 14th this slough had become detached, and was removed, exposing the bone. After a few days a fragment of bone became loose, and was removed. Peruvian balsam substituted for the warm water dressing. A few days later erysipelas developed around the wound, and spread rapidly under the iodine treatment alone. It was then painted with tr. iodine, and hot fomentations applied (?), but the erysipelas continued to spread. By advice of Dr. Hamilton, who was our visiting surgeon, the iodine was discontinued, and the arm submerged in water, to be kept constantly at 100° F., to be changed and disinfected twice a day. It commenced to improve immediately, and in three days all signs of inflammation had disappeared.

CASE 3. *Severe Laceration and Contusion of the Foot; Syme's Amputation; Erysipelas of Stump; Relative Value of Cold and Astringent Applications, and Hot Water.*—Patrick G., æt. 21 years, single, labourer, admitted to hospital July 14, 1874. Amputation performed same day, and stump placed in wire suspension apparatus. Four days after (18th) erysipelas developed in the stump, and spread rapidly up the leg under the application of lead and opium wash.

23d. Under same treatment it has extended to the knee, and is of the cellulo-cutaneous variety. Poultices of flaxseed meal applied.

26th. No improvement. Erysipelas still extending. Lead and opium wash reapplied.

31st. The limb is in every respect worse. The erysipelas has extended some distance above the knee. It seems to have baffled the skill of our visiting surgeon (a skeptic as to the value of warm water), whose treatment had been followed up to this date. Hot fomentations were immediately commenced, and kept constantly renewed during the next forty-eight hours. At the end of that time the erysipelas had receded; the redness and swelling had to a great extent subsided; indeed, the improvement was wonderful. Six days after commencing the hot fomentations the erysipelas had entirely disappeared by resolution.

CASE 4. *Erysipelas of a Compound Fracture of the Leg; Developed under Imperfectly Applied Warm Water Dressing: Cured by its Perfect Application.*—J. T., æt. 60 years, male, labourer, admitted to Ninety-ninth Street Hospital January 26, 1875, with a compound comminuted fracture of the tibia and fibula, upper third. On the following day the limb was placed in a wire suspension apparatus and sheet lint, saturated with hot water, applied, but the covering of oiled silk was omitted, and the dressing was not reapplied sufficiently often to preserve an even temperature. Under this treatment erysipelas developed by January 30th, and spread rapidly up and down the leg.

February 1st. It was decided to apply the warm water dressing more perfectly, and the whole limb below the knee was enveloped in sheet lint wet with hot water, and the whole covered with oiled silk. In consequence, by the 3d the swelling and redness had disappeared to a great extent, and on the 5th it had entirely subsided.

Dr. Hamilton records one case in which erysipelas developed under the *warm water* dressing, but imperfect application was no doubt the cause, as it has never happened in my experience.

CASE 5. *Erysipelas from a Scalp Wound Rapidly Subsiding under the Warm Water Dressing.*—T. F., æt. 29 years, male, painter, was admitted to hospital January 14, 1875, with a wound of the scalp four inches long, extending from the left brow back across the frontal bone and the squamous portion of the temporal bone to about two inches above the upper border of the left ear. The periosteum was peeled up, exposing the bone for the whole length of the wound. It was closed by four silver wire sutures.

On the 16th erysipelas had developed, spreading in all directions. The sutures were removed, and lint saturated with hot water applied to the whole inflamed surface, and covered with oiled silk, held in place by a four-tailed bandage. On the following day the erysipelas had entirely subsided.

There was no constitutional treatment in this, nor any of the cases recorded, except where so specified.

CASE 6. *Erysipelas in a Compound Fracture; Removed in Twenty-four hours by Hot Fomentations.*—R. B., æt. 43 years, female, received a compound comminuted fracture of the lower third of the humerus March 14, 1875. 16th. Erysipelas developed, which spread rapidly to the middle of the arm by the afternoon of the same day. Hot fomentations were immediately applied, and on the following day the inflammation had all disappeared. No internal treatment.

CASE 7. *Idiopathic Phlegmonous Erysipelas of the Leg.*—Mrs. T., æt. 44 years, was attacked with simple erysipelas of the lower part of the left leg, but some kind friends recommended liniments, and under this treatment it spread rapidly, so that on the 9th of June, 1875, the whole leg from the ankle to the knee was found in a terribly inflamed condition, involving both the skin and subcutaneous cellular tissue. Hot fomentations were immediately commenced, consisting of cotton batting saturated with hot water, and covered with oiled silk. This to be re-wet every two hours.

11th. A small abscess was opened on the anterior portion of the leg just

below the knee. The redness and swelling, which were very great, have subsided wonderfully.

13th. That portion of the leg where most of the liniment was used has become denuded of skin, but the inflammation has entirely subsided.

In this case tr. iron was given internally in large doses.

Traumatic Gangrene:

CASE 8. *Severe Laceration of both Dorsal and Plantar Surfaces of Left Foot, with Compound Fracture of First, Fourth, and Fifth Metatarsal Bones; Foot saved by Immersion in Warm Water.*—Charles G., æt. 47 years, labourer, received the above-named injury April 2, 1874.

5th. Foot looked gangrenous, and was submerged in water at 90° F., by advice of Dr. Hamilton, Consulting Surgeon. But for his knowledge of the value of warm water in such cases, he would have advised amputation at the ankle, as the only means of saving the patient's life. (The temperature of the bath was subsequently raised to 100° F.)

8th. The leg above the level of the water was a little œdematosus.

9th. The whole dorsum of the foot is involved in the injury, and is sloughing.

10th. Where the tissues have sloughed fresh granulations are springing up.

12th. Ninth day of immersion, the œdema is much less. The whole dorsal surface has sloughed, leaving a fresh granulating surface. After the 15th the water bath was used during the day, and hot fomentations were applied at night. After the 19th hot fomentations alone applied.

22d. Three grafts applied to the dorsal surface, and hot fomentations continued.

26th. Water dressing discontinued. The grafts have taken nicely, and are spreading. Fresh grafts inserted.

May 1st. A few of the second crop of grafts have taken.

June 9th. When nearly well he was transferred to Bellevue Hospital. After his discharge he returned (August 10th) to show us that he had a good and useful foot.

CASE 9. *Gangrene following Fracture of the Leg; Spontaneous Amputation under the Water Bath.*—H. B., æt. 26 years, male, received, December 8, 1873, a simple fracture of the tibia and fibula at the lower third, with extensive laceration of the tissues, involving the vessels of the limb.

11th. The foot looked gangrenous, and sensation below the seat of fracture was entirely lost. An erysipelatous blush extended up the leg from the seat of fracture. The whole limb below the knee was immediately immersed in a water-bath at 100° F., by advice of Dr. Hamilton.

14th. The line of demarcation had formed at the seat of fracture, and the erysipelas had disappeared.

19th. The limb was removed at the seat of fracture by means of dressing forceps and scissors, with very little loss of blood, and hot fomentations applied to the stump. Patient recovered with a good stump after resection of about an inch of lower end of the tibia.

CASE 10. *Gangrene resulting from Severe Contusion of the Leg; Arrested by Warm Water.*—Thomas C., æt. 23 years, sustained, November 17, 1874, a severe contusion of his left leg and foot, with rupture of the smaller vessels, and extravasation of blood into the tissues of the whole leg. Compresses, saturated with lead and opium wash, applied, and the limb placed in a fracture box.

18th. The whole leg is black, the toes are cold and bloodless, and sensation of the foot is entirely lost.

22d. The line of demarcation is forming in one place just behind the internal malleolus.

24th. Gangrene is becoming more marked. Hot fomentations applied to the limb below the knee.

27th. Small sloughs behind the internal malleolus, and on the outer surface of the leg have separated, leaving healthy granulating surfaces. The remainder of the leg and foot are regaining a healthy appearance. No febrile disturbance. Several grafts were subsequently placed along the margin of the external wound, which took nicely. The wounds soon healed, and the patient made a good recovery.

CASE 11. Compound Fracture of the Foot, with Severe Laceration; Separation and Removal of the First and Second Phalanges of the Third Toe under the Water Bath.—Bernard W., æt. 45 years, sustained the above injury January 11, 1874. On the following day, after all bleeding had ceased, the foot was immersed in a water-bath at 100° F.

13th. The lacerated tissues presented a gangrenous appearance.

19th. After some sloughing of the tissues the first and second phalanges of the third toe were found to be loose, and they were removed; and on the following day the first and second phalanges of the second toe were likewise removed.

23d. The wounds were granulating nicely. Hot fomentations were then used at night, and the water-bath during the day.

29th. Hot fomentations alone applied. Subsequently the wounds healed without complication.

Lacerated Wounds of the Scalp:

CASE 12. Compound Comminuted Fracture of the Anterior Table of the Occipital Bone.—Edward B., æt. 27 years, labourer, sustained the above injury November 12, 1874. One silver suture, inserted in the centre of the wound, which was a long one, and the ends left open for drainage.

14th. The wound is suppurating, but the pus looks greenish and unhealthy, and small particles of bone are coming away with it. Hot fomentations applied.

16th. The wound is granulating nicely.

24th. The wound has healed without any complication.

CASE 13. Laceration of the Scalp an inch and a half long.—James D., æt. 15 years, sustained the above injury September 1, 1874, the laceration extending longitudinally over the anterior superior angle of the right parietal bone. Two sutures were inserted and hot fomentations applied. The sutures were removed on the second day, and the wound had healed partly by first intention; and by the 8th it had healed entirely without any complication.

CASE 14. Laceration of the Scalp over Left Parietal Bone.—Jeremiah C., æt. 11 years, sustained the above injury November 2, 1874. Hot fomentations applied at once. A surgeon opposed to warm water, at the time remarked that the patient was sent home for the wound to suppurate. But in his note of the 4th he states that the wound is healing nicely, and on the 10th the patient was discharged, cured without any complication.

The same surgeon, in treating an incised wound of the scalp a few days later, closed it with wire sutures. The third day after, when it com-

menced to suppurate and look unhealthy, he immediately applied warm water dressing, and the wound healed by granulation.

Cases 12 and 13 were treated in a hospital full of traumatic erysipelas.

Wounds of Compound Fractures and Lacerated Wounds in general:

CASE 15. Compound Fracture of the Leg treated successfully by Warm Water.—Thomas A., at. 20 years, admitted to hospital March 11, 1874, with a compound fracture of the tibia and simple fracture of fibula at the junction of the middle and lower thirds. The limb was placed in a suspension apparatus and the wound dressed with hot fomentations immediately on admission.

April 5. The lower end of the tibia was found to be projecting, and on the 17th it was removed with bone nippers, the same treatment being continued.

27th. The wound was healing nicely, there having been no complication.

CASE 16. Compound Fracture of the Tibia and Fibula; Plaster of Paris Splint applied; Fenestrae cut over the Wounds, which were treated successfully by Warm Water.—William McG., at. 35 years, was thrown from his wagon, the wheel of the vehicle passing over his leg. Admitted to hospital same day, September 15, 1874. On the following day a plaster-of-Paris splint was applied and fenestrae cut over the two wounds, to which hot fomentations were applied. The patient made a good recovery without any complication, the wounds healing by granulation.

CASE 17. Compound Comminuted Fracture of the Radius; Recovery under Warm Water Treatment.—Miles C., at. 38 years, admitted December 18, 1874. While ramming a load of “giant powder,” it exploded, splintering the ramrod, and driving a piece of it through the forearm at the lower third, with the effect of producing the above injury. A single palmar splint was at first applied, with a compress and bandage to control the bleeding.

On the following day the surfaces around the wound looked red and swollen, and the limb was placed in a suspension apparatus and hot fomentations applied to and around the wounds. By the next day (20th) there was marked improvement, the redness and swelling had entirely disappeared, and the wound was beginning to suppurate. The hot fomentations were continued until January 12, when the wounds were so nearly healed as to allow a re-application of the palmar leather splint. No complication followed.

CASE 18. Pistol-shot Fracture of the Radius; Ball not removed until the Twenty-second Day after the Injury; Successful Treatment by Hot Fomentations without any Complication.—Michael K., at. 78 years, labourer, admitted January 26, 1875, on which day he received a pistol-shot wound of the forearm about two inches above the radius, fracturing that bone in several places, the ball passing in on the dorsal aspect and lodging. It could not be found. On the following day the limb was placed in a suspension apparatus, and hot fomentations applied to the wound.

Feb. 17th. The twenty-second day after the injury, an abscess was opened on the palmar surface, and the ball, with some small pieces of bone, came away with the pus. The hot fomentations were continued, and the patient made a good recovery without any further complication.

Cases 15, 16, 17, and 18 were treated in a hospital ward with pyæmia and traumatic erysipelas.

CASE 19. Incision of both Superficial and Deep Palmar Arches; Secondary Hemorrhage occurring after the fourth week from the Deep Arch; Ligation of the Radial Artery; Subsequent Treatment of the Wound by Hot Fomentations.—Thomas McM., aet. 16 years, applied for treatment of secondary hemorrhage from the deep palmar arch March 16, 1879, about four weeks after the accident. The extremities of the arch could not be reached in the wound, so the bleeding was controlled by a compress of styptic cotton to the wound, and he was advised to have the radial artery ligated. The patient objected strenuously, and the parents preferred to postpone it. They finally consented to the operation April 3d. At this time the margins of the wound were inflamed, and an erysipelatous blush extended up the wrist. Immediately after the operation the cotton was removed and hot fomentations applied to the wound and inflamed surface. On the following day the redness had entirely disappeared, and the wound was granulating.

At this date (April 16th) the wound of the hand has healed under the same dressing continued since the operation.

The following case will show the relative value of cold and hot water in acute inflammation:—

CASE 20. Acute Inflammation of the Knee-joint developed under Extension.—Katie D., aet. 4 years, who had been under treatment two years for chronic inflammation of the knee-joint, and was running around with Dr. Sayre's knee extension apparatus applied, was attacked suddenly with acute inflammation of the joint, without any ascertainable cause except the extension. Ice cloths were applied and the extension lessened, but the inflammation extended rapidly up the thigh and down the leg, accompanied with great swelling and redness, presenting the appearance of erysipelatous inflammation. The swelling was so great two days later (Jan. 24th, 1879) as to necessitate the removal of the instrument. The ice cloths were continued to the whole inflamed surface and around the joint, and a posterior wooden splint applied to keep the joint at rest.

26th. The inflammation of the tissues continued to extend and the joint was even worse. An ice bag was applied around the joint, and the cold cloths to the thigh and leg continued.

28th. The whole limb, from the middle of the thigh to the foot, was acutely inflamed, and the joint was exquisitely sensitive. It could not be touched without occasioning screams of agony from the little sufferer. It was even more sensitive than when last seen, and the inflammation of the tissues was extending rapidly. Warm water was immediately determined upon, and the whole limb was enveloped with hot fomentations and covered with oil silk.

30th (only two days later). The improvement was miraculous. The limb could be handled without causing pain, and the redness and swelling had nearly disappeared. The hot fomentations were continued, and in two days more she could stand upon the limb, and the joint could be moved without giving pain. The acute inflammation had entirely subsided. After this the hot fomentations were continued to the joint, and at this date (March 15th) she is walking around without an instrument (only a posterior wooden splint).

In conclusion I will refer to a case of phlegmasia dolens treated successfully by warm water, which was reported by me in the *Hospital*

Gazette of November 28, 1878. In this case, after all other means were exhausted and no relief obtained, it was determined to use hot fomentations, which gave immediate relief, and under their continued application a cure was effected.

Resumé.—From a study of these cases I think we are justified in concluding that in Case 1 erysipelas could have been prevented if *warm water* had been used instead of the tr. of iodine.

In Case 2 erysipelas could have been arrested in 24 hours had warm water been used at first.

In Case 3 the whole foot could have been saved, in the first place, if it had been immersed in a water-bath, for the injuries were less severe than in Case 8; but, unfortunately, our consulting surgeon was skeptical as to the value of the *warm water* dressing. And in the second place, had hot fomentations been applied when erysipelas first made its appearance, it could have been arrested, and the patient would have been saved much suffering.

Cases 4, 5, and 6 speak for themselves.

Amputation at the knee, or immediately below, would have been necessary in Case 9, if warm water had not been used; whereas, spontaneous amputation took place at the lower third of the leg. In this case, also, erysipelas was arrested by its use.

Case 10 shows that gangrene can be arrested by warm water, and also that grafts will take under warm water dressing.

In Case 11 amputation at the tarso-metatarsal joint was the indication, whereas by the use of warm water the whole foot was saved.

Erysipelas and pyæmia were prevented in Cases 15, 16, 17, and 18.

In Case 19 erysipelas was arrested. This case shows, also, that a wound will cicatrize completely under the warm water dressing.

ARTICLE X.

A COLORIMETRIC METHOD FOR THE QUANTITATIVE DETERMINATION OF THE BILIARY ACIDS AND COLOURING MATTER. By J. O. HIRSCHFELDER, M.D., Professor of Materia Medica in the Medical College of the Pacific, San Francisco.

HERETOFORE there has been no method for the quantitative determination of the biliary acids and colouring matter, which could be quickly performed with a small quantity of bile, and the need of such a method in a set of investigations of the bile led to the discovery of one combining the requisite qualities with tolerable accuracy.

The older methods for determining the biliary acids, the glycocholic and taurocholic acids, demand a great deal of time and attention, and

withal are very inaccurate. The colouring matter has been determined not by direct methods but through exclusion, a mode than which none more unsatisfactory could be imagined.

The oldest method for the determination of the biliary acids is the precipitation of them from an alcoholic extract by means of ether. This precipitate has been proven by Trifanofski¹ to consist only to the extent of 60 per cent. of the salts of the biliary acids, the rest being chloride of sodium and fatty salts of soda. The results that have been attained according to this method by Frerichs and Gorup-Besanez are consequently incorrect.

A second method, by the precipitation from an aqueous solution by sugar of lead and ammonia, is that most in use at present. It is very elaborate, and demands many various procedures, and requires many days for its completion. The precipitate is washed, dissolved in alcohol, and transformed into the salt of soda by the carbonate of soda. The mixture is then evaporated to dryness, and the biliary salt of soda is dissolved out with alcohol. The alcoholic solution is evaporated to dryness, and the residuum weighed. Irrespective of the experimental errors that can occur at each step in the process too high a result is obtained by the palmatinate of soda which is present in the bile. It is changed to the palmatinate of lead which is soluble in alcohol, and on being changed back again to the palmatinate of soda is weighed with the rest. This error might be avoided by washing out the lead precipitate with ether in which the palmatinate of lead is soluble, but not the glycocholate or taurocholate.

A third method, that of Hoppe-Seyler,² consists in drying the substance, washing with alcohol and then with water slightly acidulated with acetic acid, and filtering. The filtrate is dried, dissolved in alcohol and refiltered. The last filtrate is dried, dissolved in a small quantity of alcohol and precipitated by ether. The precipitate is frequently dissolved in alcohol and reprecipitated by ether in order to free it from inorganic salts, and then is finally dried. It is dissolved in a small quantity of water, and sealed in a glass tube together with crystallized caustic baryta, and then warmed in an oil bath of a temperature of 120° to 130° C. during twelve hours in order to change the biliary acids into cholic acid. The excess of baryta is precipitated by carbonic acid and filtered. The filtrate is dried, acidulated with hydrochloric acid, and ether poured over it. The vessel is allowed to stand uncovered for a few days until the ether evaporates. The cholic acid thus formed is collected on a filter, washed with cold water, dissolved in alcohol, dried at 105° C., and weighed. From the cholic acid formed the glycocholic acid is calculated.

This method is very elaborate and demands a great deal of time, and certainly possesses no advantages over the above-mentioned method of precipitation with lead modified by subsequent washing with ether.

¹ Pflueger's Archiv, ix., p. 492.

² Trifanofski, loc. cit.

Inasmuch as none of these methods permits the requisite rapidity and accuracy of determination, and large quantities of the substance to be examined are necessary, I resorted to a new method—a colorimetric one.

As a norm, I determined the dilution of a solution of glycocholate or taurocholate of soda at which the reaction of Neukomm ceases. I found that this reaction always ceased at a certain point, and was therefore entitled to conclude that whenever I diluted a solution until the reaction ceased I had the above found per cent. present in the final dilution. I made the reaction by mixing a drop of the solution with one of a 25 per cent. sulphuric acid and a strong solution of cane sugar upon a porcelain cover, spreading it carefully and gently heating over a small gas flame. A violet color is produced if biliary acid be present in a sufficiently large quantity, but upon the border of the final dilution the violet color becomes more and more indistinct, and finally becomes light brown. This is the point desired.

In this manner I obtained the following result:—

Glycocholate of Soda.

$$10 \text{ c. e. solution} = 182.3 \text{ mgm. glycocholate of soda.}$$

$$10 \text{ c. e.} + 90 \text{ c. e. H}_2\text{O} = 100 \text{ c. e. } (\text{a})^1$$

$$10 \text{ c. e. } (\text{a}) + 140 \text{ H}_2\text{O} = 150 \text{ c. e. terminal reaction.}$$

$$10 \text{ c. e. orig. sol.} = 1500 \text{ c. e. term. react.} = 182.3 \text{ mgm. glycocholate of soda.}$$

$$10 \text{ c. e. } " " = 1.215 \text{ " " }$$

The substance producing the reaction is the cholic acid, and hence if we desire to compute from the value found here at what point the reaction would cease with a solution of the cholic acid, we need only compare the atomic weight of the glycocholate of soda with that of the cholic acid as follows:—

The atomic weight of the glycocholate of soda is 487, and that of the cholic acid is 408, hence

$$487 : 408 :: 1.215 : x$$

$$x = 1.01$$

By direct experimentation we find

$$10 \text{ c. e. terminal dilutions} = 1.0025,$$

which difference falls within the limit of experimental error. In the same manner we would find by calculation for the taurocholate of soda the terminal dilution as follows:—

$$487 : 537 :: 1.215 : x$$

$$x = 1.34$$

The taurocholate of soda with which I experimented was impure, containing probably free cholic acid which reduced the value found so that the result obtained was

$$10 \text{ c. e. terminal reaction} = 1.1$$

¹ (a) meaning first dilution.

Inasmuch as in the examination of the bile we do not know whether we have glycocholate or taurocholate of soda present, it will be best to calculate it in the form of cholic acid.

No method for the quantitative determination of the bilirubin heretofore existed except that of Vierordt, through absorption of a part of the spectrum, which is so complicated and demands so much time and care that, although this was until now the only method for the quantitative determination of this highly important substance, it has been hardly ever employed. In the colorimetric method for the quantitative determination of bilirubin the same principle is employed as in the case with the biliary acids.

A solution of bilirubin containing a known quantity of that substance is diluted with water until the play of colour produced in it by nitric acid, the so-called reaction of Gmelin, ceases, and in order to avoid errors through the waste of too large quantities in making the test, I employed small test-tubes, made of glass tubing having a calibre of about four millimetres.

The result was the following:—

11.5 mgm. of bilirubin were dissolved in a small quantity of a solution of the bicarbonate of soda, and diluted so that the mixture was exactly 100 c. c.

$$\begin{array}{rcl} & 34 \text{ e. c. } & \\ 5 \text{ e. c. solution} + & \left. \begin{array}{l} 36 \\ 35 \\ 35 \end{array} \right\} & 35 \text{ H}_2\text{O} = 40 \text{ e. c. terminal reaction.} \\ & 35 & \end{array}$$

100 c. c. original sol. = 800 e. c. terminal dilution = 11.5 mgm. bilirubin.

$$100 \text{ c. c. } " " = 1.43 " "$$

That is to say, the reaction of Gmelin ceases as soon as we have a dilution such that in 100 c. c. of fluid there are contained 1.43 mgm. bilirubin. Inasmuch as in certain experiments we operate with solutions containing less than 1.43 mgm. of bilirubin in 100 c. c. of fluid, I determined at what dilution the colour of the solution was no longer appreciable. For this purpose I took two equally white test tubes, marked off an equal height on both, and compared the colour of the diluted solution in the one with that of a similar column of water in the other.

I found with a column of fluid 8 c. m. in height, the following:—

$$1 \text{ c. c. sol. bilirubin} + 49 \text{ c. c. H}_2\text{O} = 50 \text{ c. c. 1st dilution.}$$

$$\begin{array}{rcl} & 150 \text{ c. c. } & \\ 10 \text{ c. c. 1st dilution} + & \left. \begin{array}{l} 140 \text{ c. c. } \\ 150 \text{ c. c. } \end{array} \right\} & 146\frac{2}{3} \text{ c. c. } = 156\frac{2}{3} \text{ terminal dilution.} \end{array}$$

$$100 \text{ c. c. orig. sol. } = 78333 \text{ c. c. term. dil. } = 11.5 \text{ mgm. bilirubin.}$$

$$100 \text{ c. c. } = 0.0146 " "$$

I employed these norms in the examination of the bile, and the result of the chemical investigation of 18 specimens of human bile is shown in the following table:—

Human Bile.

No.	Specific gravity.	Water.	Solids.	Inorganic.	Organic.	Bilirubin.		Biliary acid.	
						Gmelin.	Colour test.	Cholic acid.	Glycocholate of soda.
1	1012.86	96.50	3.50	0.89	2.61	0.2288	0.1752	0.0768	0.96
2	1031.44	79.32	20.68	1.40	19.28	0.20755	0.2180	1.728	2.16
3	.....	97.03	2.97	0.73	2.24	.....	.....	.....	.....
4	1024.61	85.85	14.15	1.50	12.65	0.7436	0.7008	1.82	2.4
5	1015.75	90.32	9.68	1.276	8.404	0.3003	0.24528	0.96	1.2
6	1018.52	89.40	10.60	9.67	9.93	0.4004	0.4015	1.152	1.44
7	1030.75	86.46	13.54	2.568	10.972	0.6435	.....	3.648	4.56
8	.....	.....	.....	.....	.....	0.5434	0.5740	1.632	2.04
9	1014.65	92.70	7.30	1.00	6.30	0.5005	0.4380	1.152	1.44
10	.....	.....	.....	.....	.....	1.287	.....	3.84	4.80
11	1016.12	88.15	11.85	1.09	10.76	0.858	.....	0.576	0.72
12	.....	86.10	13.90	1.36	12.54	1.001	1.095	1.92	2.40
13	.....	.....	.....	.....	.....	0.45475	0.4745	1.248	1.56
14	1015.85	90.66	9.34	1.16	8.18	0.858	0.949	1.20	1.50
15	.....	94.67	5.33	0.797	4.533	0.143	.....	0.768	0.96
16	.....	81.60	18.40	1.68	16.72	4.6475	4.9275	3.12	3.9
17	1040.95	78.10	21.90	1.80	20.10	5.3625	5.11	5.52	6.9
18	.....	82.50	17.50	1.80	15.70	5.005	.....	1.776	2.22
Av.	1022.14	88.62	17.38	1.388	9.992	1.49	.....	1.819	2.329

The bile of three dogs examined in a similar manner gave the following result :—

Bile of Dog.

No.	Spec. grav.	Water.	Solids.	Inorganic.	Organic.	Cholic acid.	Bilirubin, Gmelin.
1	1036.27	81.26	18.74	1.828	16.12	8.50	0.1573
2	1036.39	81.46	18.54	1.75	16.79	8.75	0.1287
3	1037.30	80.18	19.82	1.86	17.96	13.50	0.23195
Aver.	1036.65	80.96	19.04	1.81	17.23	10.25	0.17265

ARTICLE XI.

PALATO-PHARYNGEAL TUMOUR. By JOHNSON ELIOT, M.D., Professor of Clinical Surgery in the Medical Department of the University of Georgetown; one of the Attending Surgeons to Providence Hospital.

PHARYNGEAL growths are comparatively of rare occurrence. When they do occur, however, they are extremely annoying to the possessor, and must prove fatal ultimately by interfering with respiration and deglutition. Their removal is always attended with danger. Situated in a highly vascular region, the hemorrhage attending their extirpation is profuse, and the surgeon meets with great difficulty in arresting it, from inability to find and ligate the bleeding vessels. Anæsthetics cannot be administered with

safety. Thus the operator is subjected to the additional annoyance of a consciousness of his patient's sufferings.

But few cases of pharyngeal tumours are reported. The most interesting is that of Skeys (see *Lancet*, 1857, vol. i. p. 242), and approaches nearer in character to the one in question than any recorded.

Some nine years ago I was requested by Prof. Robert Reyburn to see Captain B., aged 29. The captain's history was excellent; he had never suffered from constitutional disease of any description, was physically well developed, and presented a specimen of perfect health. During the late war he served in the army (Federal) as captain of volunteers (infantry), and distinguished himself for valour and endurance in several campaigns. He was wounded three or four times, and at the battle of the "Wilderness" lost his thigh at the upper third by shell-shot. In 1869 he first discovered enlargement in the tonsil gland of the right side; gave but little attention to it at the time. During 1870 part of the growth was removed from the soft palate by Prof. R. Reyburn, it being then quite small in size. The swelling gradually extended to the palate of the same side, affecting his voice without any other inconvenience. Upon examination we found the right tonsil enlarged, with a tumour occupying one-fifth of the hard palate; the palatine swelling was smooth, symmetrical, with the mucous covering apparently thickened; there was also congestion of the surrounding tissues.

The tumour was painless, firm, but slightly resilient on pressure. We came to the conclusion that it was either fibrous or cartilaginous. There was no glandular implication on the cervical or submaxillary regions. He informed us that the tumour had grown slowly; it had not as yet interfered with respiration or deglutition. He sought relief, and expressed a willingness to have it removed, insisting on the administration of ether. We reluctantly acceded to his wishes. A few inspirations of the anaesthetic satisfied us of the danger attending its administration; it was immediately withdrawn. A second attempt to etherize him was made, but discontinued at the approach of asphyxia. After the removal of a small portion of the tumour the ease was abandoned, he refusing to submit to the operation without anaesthetics, which we declined to administer.

Early in December last he placed himself under the charge of Dr. Ralph Walsh of our city, and by that gentleman I was invited to see him. Dr. Reyburn was added to the consultation. At this consultation we found him in a truly deplorable condition. The tumour had extended over three-fourths of the hard palate, the uvula and half arches were forced back and obscured from view, the tongue was depressed, with scarcely space to pass the finger between that organ and the tumour. The corresponding sides of the face and neck were enlarged by the external protrusion of the tumour. The connection of the growth between the palatine and submaxillary region was readily diagnosed; pressure on the palatine aspect increased the fullness in the submaxillary region. His respiration was so embarrassed and stridulous that it was painful to be in his company. The recumbent position was "painful and suffocating." His countenance livid, articulation indistinct, mastication painful, and deglutition difficult. He informed me that within the last month the tumour had increased rapidly; he could almost mark its daily growth. He was despondent, anxious, and apprehensive of the result; he felt a cord daily tightening around his neck, that must eventually suffocate him. His affection was so terrible that life had ceased to be a boon. He was now willing to submit to sur-

gical interference. To insure him every care and attention during his illness, we advised his friends to place him in Providence Hospital, an institution under the supervision of the Sisters of Charity. A consultation of the surgical board of the hospital was held. Professors Ashford, Reyburn, Walsh, and Busey were invited to be present. It was determined at the consultation to operate at an early day. Hoping to give temporary relief, and also for the purpose of exploration, I introduced a small trocar into the palatine tumour on the 26th of December. Nothing escaped from the puncture but a few drops of blood, giving no relief. A question arose as to the proper mode of procedure in the case. Anaesthetics were out of the question, unless tracheotomy was premised and the posterior fauces plugged. The difficulty was solved by the captain offering to submit to the operation without etherization. We hardly hoped to remove the whole mass through the palatine incision, and anticipated a second one in the cervical region. On this point we were agreeably disappointed, as the result shows.

On the 3d of January, 1879, assisted by Prof. J. Ford Thompson, of the hospital staff, Profs. Reyburn, Ashford, and Walsh, a semilunar incision was made on the posterior margin of the hard palate, another was made on its anterior portion, connecting the latter with the first, leaving an ellipse of two inches in width. The circumscribed part was seized with a strong vulsellum, and traction made. The dissection was necessarily slow from frequent interruption by the patient freeing his mouth and throat from blood. An hour elapsed before the cervical portion of the tumour was raised from its bed. The hemorrhage was considerable. No vessels were tied; no haemostatic used; the bleeding ceased on the completion of the operation; the mass was removed in detached pieces.

Upon superficial examination it appeared to be sarcomatous in character. A portion of it was preserved for microscopic examination, but by some accident was mislaid. Its slow and painless growth, partially capsulated character, the unimplicated glands in the vicinity of the tumour should encourage us to hope for no further trouble. The result of the operation thus far has been highly gratifying. The captain's articulation is now clear, respiration easy, deglutition unimpaired.

The tumour evidently originated in the tonsil gland, and slowly encroached on the palate, meeting with resistance at this point. It took a downward course in the walls of the pharynx, where it met with less opposition, and finally made its appearance in the more yielding tissues in the submaxillary and cervical regions. An examination of the patient a few days since shows no manifestation of the return of the disease.

ARTICLE XII.

**INTRA-ORBITAL SARCOMA, FORCING THE EYE DOWNWARDS AND FORWARDS;
REMOVAL, AND REPLACEMENT OF THE EYE.** By JOHN H. PACKARD, M.D.,
Surgeon to the Episcopal Hospital, Philadelphia.

Mrs. D., now æt. 67, was first seen by me some ten years ago, casually, when I was in attendance upon a member of her family. She had then a most marked, and indeed hideous, deformity from the displacement of her

right eyeball. Not being consulted about it, I never made any reference to it until early in March of this year, when she needed treatment on account of an attack of bronchitis. At this time I not only noticed that the protrusion of the ball was much greater than when I had last seen her (which was in July, 1877), but it was obvious that it was a source of constant annoyance and suffering. Upon asking her about it, she told me that in 1847—thirty-two years previously—she had had a severe confinement, and felt something give way about the eye. From that time there was a gradually increasing sense of swelling, and the globe began to be pressed downwards, subsequently coming forwards also. The protrusion had been growing much more rapidly of late. The pupil of the right eye was a full inch below that of the left.

The accompanying sketch, which she allowed me to make, may give some idea of the ghastliness of the deformity, which mortified her so much by the attention it attracted, that she had almost entirely ceased to leave the house.

Besides this, however, she was greatly annoyed by the frequent displacement of the upper lid, which would become engaged in the sulcus behind the globe, producing intense distress until replaced by manual effort. This obliged her to bandage the eye before going to sleep, either at night or by day. In order to read, she placed her hand over the affected eye, not only to hold the lids, but to shield it, and to aid her in disregarding the image on that retina.

Vision was still good, in spite of the change of shape induced by the pressure of the tumour, and the motions of the ball were free and normal.

On consultation with Dr. Thomson, who kindly saw her with me, I proposed to her to attempt the removal of the tumour, which could be readily felt as a dense semi-elastic mass below the supra-orbital ridge; and to this she readily consented.

Accordingly, on March 30th, in presence of Drs. Thomson, Harlan, and Schell, and Mr. Currie, medical student, she was etherized by Dr. Williamson, and I made an incision obliquely through the skin just below and parallel with the eyebrow. The tumour was very soon reached, and by means of the fingers and knife-handle enucleated. It seemed to have been attached only slightly, somewhere near the back part of the roof of the orbit. The wound was closed with fine silver-wire sutures, a small drainage tube being left at its outer angle; and a water dressing was applied.

For a few days she was much annoyed by a cough, which seemed to be a re-development of her previous bronchitis, perhaps the effect of the inhalation of ether. Some trouble was given also by eversion of the lower lid, kept up by spasm of the orbicularis muscle; but this was overcome by the careful application of a compress and adhesive plaster.



To-day, the forty-fifth since the operation, the eye is very nearly in its normal position, and follows the movements of its fellow accurately. Dr. Thomson has at my request examined the eye, and informs me that he finds it, corrected with a glass of 5 dioptres, to possess an acuity of vision of $\frac{20}{L} = \frac{1}{2\frac{1}{2}}$. There is slight astigmatism, which might be more closely corrected by a cylindrical glass. Vision is binocular. Hence it may be justly claimed that there is no loss of sight; and with suitable glasses she would now be able to read or work as she did thirty years ago. The wound has left very little scar; the greatly redundant skin in the upper lid has been much reduced by shrinkage, which process is still going on, so that she feels herself daily lifting the lid better and better.

The tumour, which was about the size of a hen's egg, flattened above and below, was submitted to Dr. Morris Longstreth for microscopic examination, and was found to be a spindle-celled sarcoma.

This case seems to me chiefly remarkable on account of the very slow growth of the tumour, the slight interference with the nutrition of the eye itself and of its appendages, and the ease with which it was enucleated. As to its origin, there is perhaps room for some doubt; it did not seem to be connected with the lachrymal gland, which I think was left untouched; and I would hazard the suggestion that it may have been developed from a blood-clot effused at the time of the severe confinement mentioned as having occurred in 1847.

Another point of interest is the complete restoration of the organ to its normal position, and the preservation of the movements in spite of the long and apparently extreme stretching to which the muscles and nerves had been subjected.

Two matters connected with the operation may be further referred to. One is the oblique mode of incision, by which the scar was rendered almost a mere hair-line. The other is the use of the drainage-tube, which prevented all risk of bagging of pus in the space left by the removal of the tumour.

The literature of the subject is so readily accessible that I content myself with simply placing this case upon record, without quoting the opinions or statements of others.

1924 Spruce Street, Philadelphia, May 14, 1879.

ARTICLE XIII.

CONTRIBUTIONS TO THE MINUTE ANATOMY OF THE LIVER.¹ By WILLIAM G. DAVIS, M.D., of Philadelphia.

In investigating the anatomy of the liver, the proper injection of the vessels is a matter of the greatest importance. The principal vessels to

¹ Abstract of an Inaugural Thesis presented to the Medical Faculty of the University of Pennsylvania, and to which was awarded the Henry C. Lea Prize.

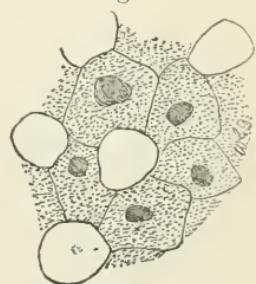
be injected are the venous, the arterial, and the biliary capillaries. In injecting any of these, the one fact constantly to be borne in mind is that the liver must always be kept warm and moist. Its surface should not be exposed to the air. To harden the specimen, Müller's fluid or alcohol may be used. The former is only to be employed with uninjected specimens or those injected solely with Prussian blue, as it destroys the colour of carmine. Specimens injected with carmine should be put into weak alcohol, to which a little acetic acid has been added. Specimens preserved in Müller's fluid may be transferred from it to a concentrated alcohol for a few hours before making sections. Specimens injected with nitrate of silver should be transferred to the freezing microtome, and sections made immediately. These sections should then be exposed to the light. The fluids used for injections are of two kinds—gelatine masses and cold flowing liquids. For the bloodvessels a solution of gelatine should be used. It may be coloured with carmine, Prussian blue, or chromate of lead. For the bile ducts, a watery solution of Prussian blue may be employed. The blue used in this case was a washing blue called "cream indigo."

To demonstrate the epithelium of the bloodvessels, the latter may be injected with .25 or .5 per cent. solution of nitrate of silver. This should be followed by an injection of warm water, and the liver then transferred to the freezing microtome. Liquids containing glycerine should be avoided, as it is impossible to harden the specimen either by freezing or with alcohol. For staining, Beale's carmine or haematoxylon may be used. The slightest trace of acid destroys the colour of the latter.

Hepatic Cells.—These are rounded in form, and lie embedded in the vascular and biliary capillary network. Their form is dependent on the amount of pressure in the bloodvessels. When the latter are empty, the cells are rounded; when they are distended, the cells where they touch each other are flat; where they touch the bloodvessels, they are notched (fig. 1). Excessive vascular distension causes the cells to appear as narrow bands of granular matter. They do not possess walls (contrary to Schmidt,¹ but in accord with Frey²). According to Pflüger,³ they have walls which are continuous with the bile capillary walls. According to Kolatschewsky,⁴ the substance of the cells is continuous with the same. This has not been observed, though carefully looked for.

Hepatic and Portal Veins.—In injecting the venous capillaries, the

Fig. 1.



Liver of Rabbit, showing cells modified by distension of the bloodvessels.

¹ Schmidt. Monthly Microscopical Journal, August, 1870.

² Frey. Microscope and Microscopical Technology. Amer. ed., 1872.

³ Pflüger. Archives der Physiolog., 1869, 9 and 10 heft.

⁴ Kolatschewsky. Schwalbe's Archiv für Mik. Anat., 1877.

hepatic vein should always be chosen. Injecting by the portal vein necessitates so much exposure of the organ that the injection at best can only be partial. The animal being etherized, an incision is made in the right lumbar region. The ascending cava is then ligated just beneath the edge of the ribs. The incision is then to be closed with two or three stitches. With a strong pair of scissors a large piece is cut out of the right thoracic walls. The hepatic vein (thoracic ascending cava) is now seen coming from the diaphragm. A spring clip should now be put on its diaphragmatic extremity, and a ligature on its cardiac extremity. This prevents the blood coming either from the liver or from the heart. The vein may now be nicked with the scissors, between the clip and ligature, and the canula inserted and tied therein. The injecting syringe being filled, the canula should be cleansed of clots by means of a wire. The clip is now removed, and, as the blood oozes out, the syringe is inserted and the piston pressed gently but rapidly home. The blood leaves the liver and collects in the intestines. The portal and hepatic veins are then ligated. If enough fluid is used, the intestines may also be injected at the same time. The object of ligating the abdominal cava is to prevent the fluid going to the lower extremities. In removing the organ, care should be taken to cut on the distal side of the ligatures.

Hepatic Artery.—As regards the distribution of the hepatic artery, Chrczonszczewsky,¹ Rindfleisch,² and Green³ describe it as ending in the middle zone of the lobule, half way between the portal vein on the circumference and the hepatic in the centre. Beale,⁴ Cohnheim und Litten,⁵ and Kowalewsky⁶ describe it as ending on the periphery of the lobule. We believe that this latter is the correct method, and its demonstration may be accomplished in the following manner: The animal being etherized, an incision is made in the right lumbar region, and the abdominal aorta and vena cava ligated; this may be done with a single thread. The thorax is then opened and a clip placed on the hepatic vein. A canula is then inserted into the thoracic aorta and a cold flowing blue mass thrown downwards. After two or three syringefuls the vessel is ligated. A canula is now inserted in the hepatic vein, and a red gelatine mass injected downwards. As the red liquid flows into the vein, it meets the blue from the artery and washes it out the portal vein. The blue liquid then remains in those capillaries only which are purely arterial, being kept from regurgitating by the ligature on the aorta. The organ may then be

¹ Chrczonszczewsky. Quoted by Cohnheim und Litten. Virchow's Archiv, 1876, pp. 156-165.

² Rindfleisch. Pathological Histology.

³ Green, J. Henry, M.D. Introduce. to Path. and Morbid Anat., 1876.

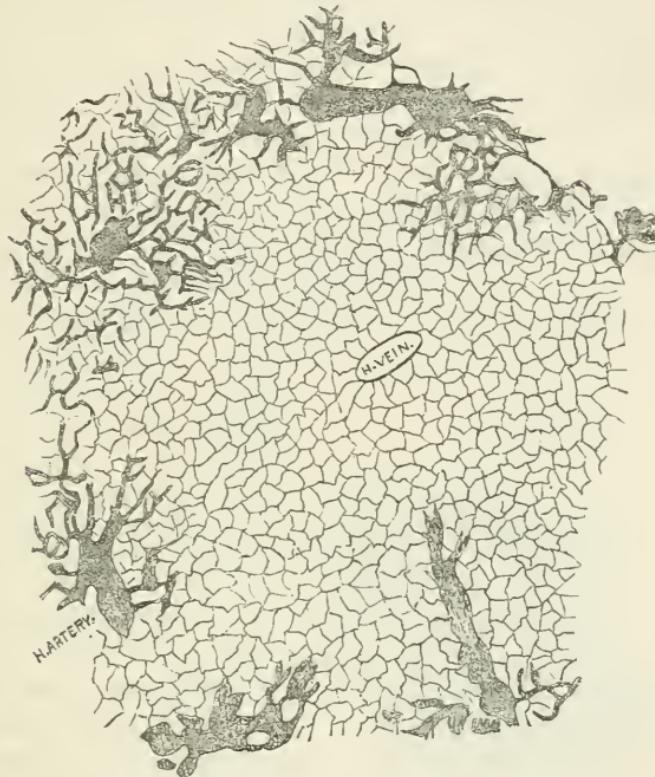
⁴ Beale. How to Work with the Microscope, p. 140.

⁵ Cohnheim und Litten. Virchow's Archives, bd. 67, 1876.

⁶ Kowalewsky. Protocols of the meetings of the Russian Natural Scientists and Physicians, 1876.

removed as before described. In a preparation made in this manner, the artery is seen breaking into capillaries on the border of the lobule and anastomosing with the vein. With Schmidt we have failed to see any branches distributed to the capsule. (See fig. 2.)

Fig. 2.



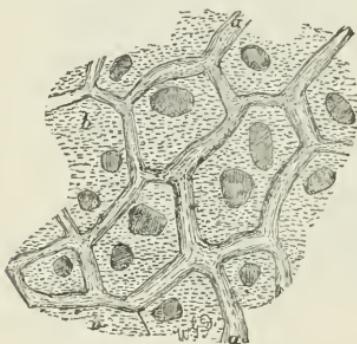
Liver of cat. The artery is seen on the edge of the lobule breaking into capillaries; these empty immediately into the capillaries which unite to form the hepatic vein.

Hepatic Duct.—In studying the distribution of the duct, it is desirable to have the bloodvessels injected. This may be done as detailed for the portal and hepatic veins. The large vessels being ligated, the liver is to be removed to a capsule of warm water. The ductus communis choledochus should be tied and a canula inserted into the gall bladder. This is just as efficient and easier than to insert it into the duct. The organ may now be injected either with the syringe, or by means of a constant pressure of a column of liquid, or by means of atmospheric pressure. In this last method the capsule containing the liver immersed in warm water is placed on the plate of an air pump. A tube passes from the canula in the gall bladder through an air-tight cork in the top of the bell glass, by which the capsule is covered. The distal end of this tube is immersed in the injecting fluid. A clamp is placed on the tube outside of the bell glass. The air is then to be exhausted. The clamp being very gradually loosened, the liquid flows into the liver; and it should be loosened only

enough to allow the gall bladder to be moderately distended. If the clamp is opened suddenly, the gall bladder will burst or extravasations will occur.

Triple Injections may be made by injecting the veins and artery as described under the hepatic artery, and the duet by one of the methods just described. Concerning the exact method of termination of the bile ducts, there is much dispute. Beale¹ still adheres to the tubular structure theory, and regards the bile capillaries as the result of a forced injection. Hering² and his followers believe that the bile capillaries exist already as fine channels. Schmidt,³ Budge,⁴ and others hold that the bile capillaries are a distinct system of vessels with walls of their own. Legros,⁵ going still further, claims to have demonstrated, by injection of nitrate of silver, the existence of epithelium in the finest bile capillaries. The vastness of this claim is such that we hope we may be pardoned for acknowledging our inability to take it all in. The view of Schmidt and Budge, which describes bile capillaries with true walls, is the one which we think correct. In fig. 3

Fig. 3.



Scale.

2000 inch.

Rabbit's liver. Bile ducts injected. *a.* Capillary bile ducts forming angular spaces in which are inclosed the hepatic cells *b.* Some of the cells have two nuclei.

are seen injected bile capillaries. The spaces are as large as an hepatic cell and *angular* in outline. If they were produced by a forced injection, the liquid would follow exactly the contour of the cells and make round spaces, the capillaries at points of junction being then much larger than between such points. When the liquid came in contact with a blood vessel, it would surround the vessel and make a curved capillary, but curved capillaries are comparatively rare. If we were able to trace a natural communication between the capillaries and larger bile ducts,

it would aid in the consideration of the subject very much. Prof. Beale, referring to this in his last paper, asks why it has not been shown. He says Hering's drawings do not exhibit it, and therefore he denies its existence. We have the good fortune to be able to produce this missing link.

¹ Beale. Archives of Medicine, 1872.

² Hering. Stricker's Manual of Histology.

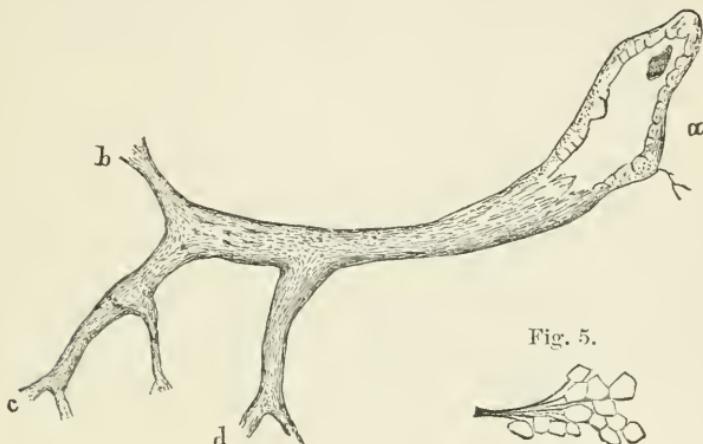
³ Schmidt. American Journ. of Med. Sciences, January, 1859.

⁴ Budge. Archiv. für Anatomie und Physiologie, 1859, p. 463.

⁵ Legros. Sur la struct. et l'épithe. propre des canaux sécréteurs de la Bile. Journal de l'Anat. et de la Phys. de l'Homme et des An. 1874.

In fig. 4 is seen a longitudinal section of a large bile duct, with its characteristic epithelium and also its blue injection fluid. At b, c, and d it breaks up into capillaries. The capillaries at b are shown increased in size in fig. 5. Each mesh contains usually one hepatic cell. Two nuclei

Fig. 4.



Longitudinal section of a bile-duct; cat's liver. At α is seen the epithelium; at b, c, and d, the duct is breaking into capillaries.

The lower figure shows the capillaries at b more highly magnified.

in a mesh may belong to a single cell. The diameter of the capillaries varies with the amount of contained liquid, but is usually from $\frac{1}{14000}$ to $\frac{1}{8000}$ in. in diameter. The former is the more common size. In support of the existence of true walls, we would say that the injection in a capillary has been seen to cease and the capillary continued by a colourless line. This latter is supposed to be the collapsed and empty capillary walls. The angularity of the spaces and the distinct limitation of the capillaries also favours this view. The injected capillaries are sometimes seen to project beyond the edge of the cells, and also at times clinging to their free sides. This is seen in fig. 6. This appearance would be impossible with no true walls. They are known to be bile capillaries by their very small size, and by being continuous with a biliary network. When the pressure has been great, the bile capillaries, instead of being straight, as is natural, are convoluted and tortuous. This would only occur in a tube with true walls. Concerning the relation of the blood to the bile capillaries, we consider, with McGillavry, that it is a matter of accident whether they touch or not. Sometimes they lay along-side of one another, and sometimes

Fig. 5.



Fig. 6.

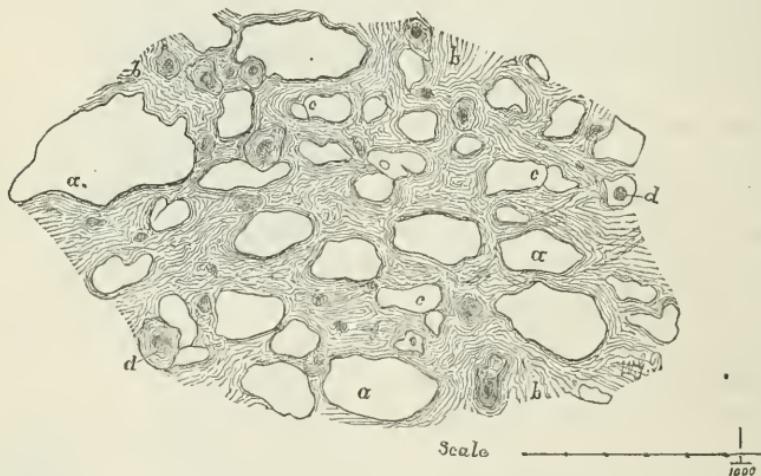


Rabbit's liver. A capillary bile duct is here seen clinging to the free side of three hepatic cells. Injected with a watery solution of Prussian blue.

they cross over each other. This is contrary to Hering,¹ Peszke,² and Orth.³ We do not accept the view of Schmidt that there exists a natural communication between the lymphatics and bile capillaries. The return of the injection fluid by the lymph canals can be accounted for by extravasations into the lymph spaces. This latter we believe we have seen in one instance. The blunt extremities of bile capillaries described by Eberth have been noted, but they are probably due to a cessation of the injecting fluid, and not of the capillary itself.

Connective Tissue.—To demonstrate the intralobular connective tissue, a piece of child's (or adult's) liver, which has been preserved in Müller's fluid, may be used. When a section is made and brushed, a connective-tissue-like network is left. This is not true connective tissue, but consists almost entirely of bloodvessels, as can readily be proven by the remains of blood corpuscles seen within them. The only true connective tissue present consists of fine fibrils which pass from one bloodvessel to another, and also those which adhere to the walls of the vessels. Both are very scanty in quantity. (See fig. 7.) There is no basement membrane of any sort

Fig. 7.



Liver of a child: cells removed by brushing.—*a.* spaces left by removal of the cells; *b.* blood-vessels; *c.* connective tissue fibrils crossing from one vessel to another; *d.* hepatic cells.

existing between the hepatic cells and the walls of the bloodvessels. What Frey in his work gives as the framework substance of the liver, and calling it a "homogeneous membrane with nuclei," is in reality bloodvessels. Fleischl⁴ has also, we believe, mistaken the bloodvessels for connective tissue.

¹ Loc. cit.

² Peszke. Beiträge zur Kenntniss des feinern Baues der Wirbeltier Leber. Dissert., Dorpat, 1874.

³ Orth. Cursus der Normalen Histologie. Berlin, 1878.

⁴ Fleischl. Ber. d. Königl. ges. d. wiss. 1874, tafel I.

Lymphatics.—An attempt was made to demonstrate these by means of a method suggested to me by Dr. E. O. Shakespeare. The abdomen of an etherized animal was opened and a stick of diluted nitrate of silver rubbed over the surface of the liver. In a half an hour the animal was killed and sections made with the freezing microtome. In the two experiments made in this manner, the peritoneal surface was coloured with the nitrate of silver, but there were no lines going inward to indicate the course of the deep lymphatics.

ARTICLE XIV.

SANITARY DRAINAGE. By M. CAREY LEA, Esq., of Philadelphia.

IT is only of late years that attention has begun to be intelligently directed to the dangers which we have introduced into our houses together with the “modern conveniences.” The investigation of the subject has revealed both ignorance and recklessness—ignorance of the laws which govern the movements of mixed liquids and gases in more or less confined tubes, and recklessness in introducing fixtures connected with sewers and imperfectly protected from sewer gas into confined spaces adjoining sleeping rooms, and connected with them. The results have been such as to make it evident that there exists a pressing need for a wide diffusion of knowledge on the subject of drainage, especially amongst medical men, in order that they may insist on a radical change in certain of the methods now in use. For want of this reform, it is no exaggeration to say that not a house in a hundred in any of our large cities is properly protected from sewer gas.

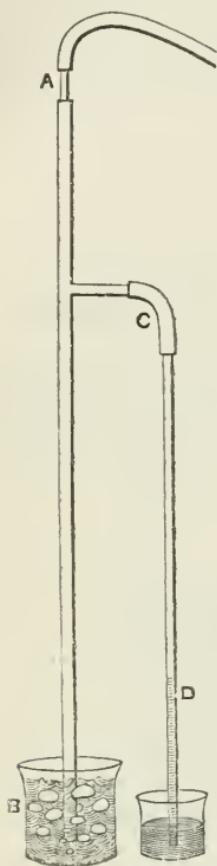
Soil Pipes and Traps.—To correctly understand the workings of our most common arrangements for drainage, it is desirable to obtain an insight into the nature of the movements of currents of water and air mixed in tubes.

Over the pipe of a water faucet let us attach a few feet of rubber tube, and insert in the other end of the rubber tube a glass tube as thick as a quill, and two or three inches long. Let another glass tube of half an inch internal diameter and three or four feet long be held vertically in a glass beaker. If now we insert the small glass tube into the upper end of the vertical tube, and turn on water, we shall find that the water in descending carries with it a great quantity of air, which becomes entangled in the descending current, and rises tumultuously in bubbles in the beaker.¹

¹ The principle here involved is used on a great scale in Catalonia for providing an air blast for furnaces. Mountain streams are conducted over steep cliffs and into large pipes, too large to be filled by the stream, which in descending produces a powerful and steady blast of air.

If we now insert a small horizontal tube into the side of the larger, a few inches from the top, we shall find that a powerful *suction* is exerted

Fig. 1.



In the upper end, *A*, of a tin tube is loosely inserted a glass tube of much smaller diameter, connected by a rubber pipe with a water faucet. On admitting a stream of water through the small tube at *A*, great quantities of air are carried down into the beaker *B*, together with the water.

If a small tube *C* is inserted into the side of the vertical tube, a powerful suction is found to be exerted in it, which may be measured by attaching a rubber connection to a glass tube plunged in water. The height, *D*, to which the water rises measures the amount of suction exerted.

through the horizontal tube, which may be rendered evident by applying a taper, or, still better, by attaching a glass tube by a short tube of rubber, and plunging the lower end of the tube in water. The extent to which the water rises will mark the amount of suction exerted. For many years past I have used both these forms of action in my laboratory, the one for driving blowpipes, the other for aspirating. For both purposes the results are most excellent.

The principles involved in the above experiments will explain the most complicated actions which take place in soil pipes and water-closet traps. The action of the discharge water in a soil pipe is precisely similar to what takes place in the pipe *A B*, and the aspiration or suction through *C* is exactly what occurs in traps attached laterally to the soil pipe.

The most common form of arrangement in houses built within the last generation is to have a bath and water-closet on the second story, and the same on the third, immediately over those on the second story, and using the same soil pipe. Older houses have been mostly altered to correspond more or less with the above mentioned arrangement. Wash-basins with water-faucets are very variously distributed, but connect by longer or shorter waste pipes with the soil pipes at or about the same places where the bath and water-closet discharge. I shall, therefore, as a general form, consider the case where a bath, closet, and basin are placed in a second story room, with a similar arrangement in the story above, all served by one soil pipe, terminating just above the third story attachments, and connected to it through separate traps. If the bath is connected to the water-closet trap, as is most commonly done, I shall suppose the precaution

taken (which, although essential, is generally neglected) of having a trap between the bath and the water-closet trap.

Experience has shown that in such an arrangement it happens that when one of the larger fixtures is used, that is, either bath or either water-closet, it follows that one or more traps are sucked out, and free access allowed for sewer gas to enter the house, and this, not as an exception, but rather as the rule.

On examination we perceive that this evil comes in a variety of different ways, to wit:—

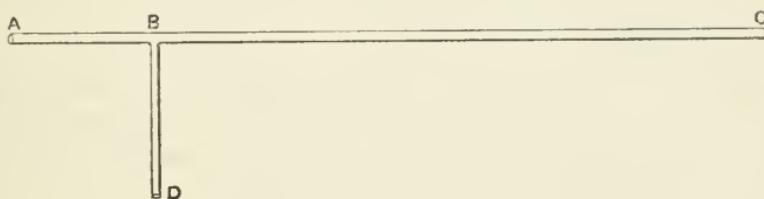
1. The use of a lower fixture may suck out an upper trap.
 2. The use of an upper fixture may suck out a lower trap.
 3. The use of any fixture may suck out another trap on same level;
- and lastly,
4. The using of any fixture may result in *its own* trap being sucked out.

(These distinctions are important because the remedies are different.)

The first capital improvement introduced into drainage was the carrying of the soil pipe of full size to and above the roof. This is indeed the foundation stone of all good plumbing. By itself, and without other aid, it cures *two* of the above cases, the first and third, and it also renders possible the curing of the other two, with the aid of other arrangements.

CASE 1. The simple carrying of the soil pipe to the roof, without diminution of size, may be said to cure Case No. 1, at least where the soil pipe has been given a full diameter in proportion to its length. The importance of a full size has, I think, not been sufficiently insisted on. The principle on which it depends, will be understood by the following experiment:—

Fig. 2.



A tube, $A\ B\ C$, has one of a little smaller size, $B\ D$, inserted at right angles. Over the end A is to be passed a rubber tube. In a flat-bottomed vessel some strongly coloured liquid is to be poured to the depth of an eighth of an inch. Into this the extremity of the tube $B\ D$ is plunged. If now, the end C being freely open, we apply a gentle and steady suction at A , by means of the rubber tube, the air in $B\ D$ is not disturbed, nor does the liquid rise in it. But if a sudden suction is applied, the liquid rises in $B\ D$ for a moment, and, by its colour, leaves a mark on the tube to show the height to which it rose. In order to get some rough numerical data, it was found that when $B\ C$ was $\frac{1}{5}$ inch diameter and 34 inches long, a tolerable suction raised the liquid in $B\ D$ 1 inch, and a strong suction $1\frac{1}{2}$ inches. In this case the length of the tube $B\ C$ was 170

diameters, and might be said to roughly correspond with a soil pipe having a diameter of 4 inches and length of 57 feet. Comparisons of this sort are however, to a large extent, illusory, and the experiment must be taken simply as illustrating the principle and indicating the danger.

The action in the soil pipe is precisely of the same nature. If the water from the emptying of a fixture descended slowly and regularly, no influence whatever would be exerted on the lateral trap in the story above, because of the slight friction of gases in moving through tubes.¹ But the sudden descent of a body of water by the emptying of a water-closet or bath, creates a suction similar to that shown in the experiment just described; and although the suction is but momentary, that moment is sufficient to empty a trap, which has rarely more than 2 or 3 inches seal. To prevent the upper trap from being emptied, we must make the entrance of air through the top of the soil pipe as easy as possible. Any contraction, therefore, of the pipe is most strongly to be objected to. The placing of a strainer or grating over the end is to be entirely condemned. There must be nothing to interfere in the smallest degree with the freest possible entrance of air at the top, to relieve the suction and save the traps. With a closed soil pipe, such as even at this time is very generally used, *this emptying takes place with the utmost facility*, and may be said to be the rule rather than the exception.

CASE 2. Even with an open soil pipe, the use of any upper fixture, especially one using as much water as a water-closet or bath, may and does suck out any trap on a lower level.

The manner in which this takes place is exemplified at Fig. 1. The lateral suction caused by a descending current of water in a pipe easily empties a trap.

The remedy for this lies in *ventilating the trap*. (This expression, which has passed into general use, tends to create a false impression; the object is not to purify the air in the trap, but, by providing for the free admission of air, to prevent emptying by suction.)

A pipe of sufficient diameter to admit of air freely (see Figs. 3 and 4) is attached at the upper side of the trap nearest the soil pipe. This pipe is carried upward parallel with soil pipe, and connected with it at a point *fairly above every other connection whatever that is made with the soil pipe*. This last point cannot be too strongly insisted upon. To attempt to ventilate a second story trap by a pipe that connects with the soil pipe *under* the third story attachments is absolutely useless. One ventilating pipe, however,² will answer for a whole series of water-closets

¹ The experience of gas manufacturing shows that a single inch difference of water-level will drive gas thousands of feet through gas mains.

² In the most modern system of English plumbing the ventilating pipe leaves the soil pipe at its trap into the drain; two or three feet beyond it is carried *into the soil pipe*, and rises through the centre of the latter to the roof, where it is carried out

or other fixtures. It should not be of too small diameter, though it is quite unnecessary in my opinion that, as sometimes alleged by good authorities, the ventilating pipe should have the same diameter as the trap which it ventilates. The friction of air in pipes, as above pointed out, is very small, and the admission free. Something will of course depend upon the number of stories on which fixtures are placed, and the number of water-closets and baths. For the common arrangement of a bath and closet on each of two stories, a ventilating pipe of two inches internal diameter should, I think, be held sufficient, if not narrowed at its connections by bad plumbing. Additional size, however, can never be a disadvantage.

CASE 3. When the common closed soil pipe is employed, the use of any fixture may cause suction enough in the soil pipe to empty the trap of another on the same level. But the open soil pipe cures this as well as Case 1; because the suction in the soil pipe takes place *below* the point at which the water enters, and therefore other fixtures which enter the soil pipe on same level are relieved by the air entering the open end of the soil pipe. (But if two fixtures on the same floor tap the soil pipe, the one below the other, the use of the upper fixture may suck out the lower. The ventilating pipe avoids this danger.)

CASE 4. The case of a fixture sucking out its own trap might, at first sight, seem to depend on the same conditions as Case 3; but this is far from being so. A fixture may suck or siphon itself out even with an open soil pipe.

Fig. 4 represents an ordinary S-trap terminating in a vertical pipe. If water trickles only into the upper opening *A*, it will escape by the lower, and leave the trap full. But if the current of water is enough to fill the tube, then, when it is stopped, the water in the lower branch will siphon the trap out. Even if the water does not fill the tube sufficiently to siphon it out, it may by entangling air, in the manner already described, produce a suction sufficient to empty the trap.¹ The remedy lies as before in Case

again. The ventilating pipes of the several traps pass through the soil pipe into the interior ventilating pipe. Those who may wish to examine further into this method will find it illustrated with excellent diagrams in the "Plumber and Sanitary Houses," by Hellyer, London, 1877. But the soil pipe thus partly filled up would seem to be easily choked or stopped up by substances improperly thrown into water closets by servants.

¹ It is believed that the emptying of traps by suction, created by the joint action of air and water in the pipes, on the principle of the Catalonian Blast, is here explained for the first time. This emptying has always hitherto been explained on the principle of the siphon. No doubt siphoning, correctly so called, may occasionally take place, but for this the quantity of water descending must, in the vast majority of cases, be altogether insufficient, especially in the case of soil pipes, the most ordinary one. To

Fig. 3.

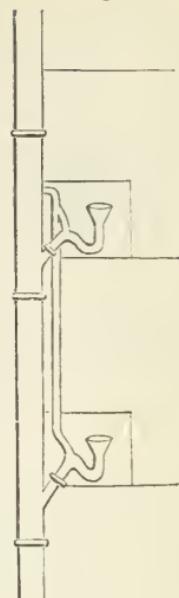
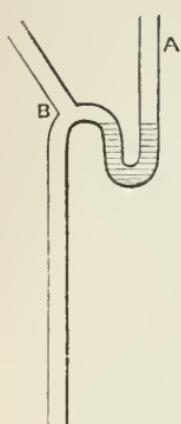


Fig. 4.



2, in ventilating the trap by introducing a tube at *B*, through which air can enter, as shown in Figs. 3 and 4.

We see, therefore, that these two capital improvements, the *carrying of the soil pipe above the roof* and the *ventilation of traps*, are sufficient to remove all danger of the introduction of sewer gas by the removal of the water seal of traps.

Before leaving this part of the subject one remark remains to be made. In the case of the small S-traps used for the waste pipes of wash basins, the orifice at *B*, figure 4, of the ventilating pipe is liable to be sometimes filled up by grease from soap. *The trap can then be siphoned out*, and sewer-gas be admitted (provided the sewer traps are not arranged as hereafter to be described). For this reason, instead of ventilating the basin traps, I prefer to use Bowers's traps. It is proper to say, however, that good authorities differ on this point. All bottle traps are liable to form collections of grease in the glass reservoir, finally stopping their action. But this trouble makes itself quickly evident; the basin will not empty. The remedy does not even need a plumber to apply it; anyone can unscrew the glass reservoir, empty, and replace it. But if the orifice *B* of the S-trap is stopped, it may not attract attention. Foul smells may be perceived, but the cause is not at once evident.

Sewer Connections.—Until very lately it has been universally considered that when a trap was interposed at the connection of the drain with the street sewer, all had been done that the most exacting could require. Experience has taught the contrary.

A sewer is an opening of immense length as compared with its breadth. The breadth is confined to a few feet, the length may extend for miles. When heavy rains take place a powerful current passes through, and the result may be either an expansive force or one of suction. The water in the river or bay that serves as outlet may or may not cover the mouth of the sewer, depending in some cases on tides, or, in the case of inland rivers, on the high or low water at different periods of the year. When the mouth is covered by water, a material obstacle is placed against the exit of the drainage.¹ A powerful expansive force results in the sewer, which must often be far more than sufficient to force the few inches of water seal in the traps along its course.

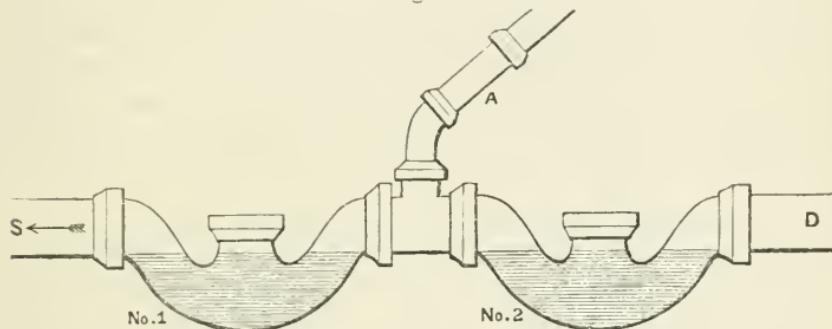
When the mouth of the sewer is uncovered, and perfectly free passage produce a siphoning action the longer leg must be full of water. The least consideration will show that this can never take place in an ordinary soil pipe by the emptying of either a water-closet or a bath.

¹ In Philadelphia instances have come to my knowledge where a heavy rain has completely filled a sewer to the top, for a distance of half a mile or over, back from the Delaware.

for its contents afforded, the action is reversed, and a force of suction ensues. This force seems to be generated somewhat in the same manner as in the case of vertical tubes already described. It is sufficient that impediments, sharp turns and the like, should at any point dash the water about so as momentarily to fill the whole section of the sewer. This suction empties the traps along the line of the sewer, and leaves free passage for sewer-gas when the sewer returns to its normal condition by the cessation of the rain.¹ Expansion and contraction may also arise from simple changes of temperature, and in the absence of rain.

Both these evils, of suction and of forcing, are cured by a single ingenious arrangement; that of placing two traps instead of one at the sewer attachment, with a ventilating pipe between.

Fig. 5.



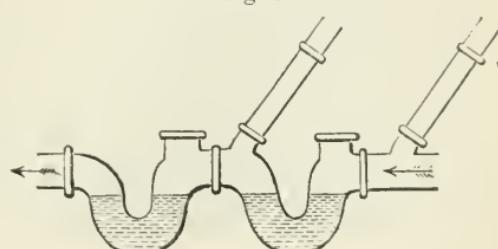
In this figure, *S* indicates the direction of the street sewer, *D* shows the end of the house drain. The ventilating pipe, *A*, is conducted to the pavement, or, better, into a kitchen flue, in the manner to be presently described.

Between the drain and the sewer are interposed two traps,² Nos. 1 and

¹ The same cause, the rain, which may tend to make a sewer suck out a trap, naturally tends also to refill the trap by the surface drainage of the house. So that, in a heavy rain, it may happen that a trap is many times sucked out and refilled. The question arises, Which action will continue longest; will the trap finally be left full or empty? The answer, I think, is, *empty*, for the sewer drains a much larger area than that of any one house, and the rush of water must continue in it after it has ceased in the house drain.

² The traps which I have shown in the above figure are of the shape usually employed in Philadelphia, and have the cleaning hole in the centre. Fig. 6 shows another form, narrower and deeper, with the cleaning hole at the top of one of the branches. It is unimportant which shape is used, provided the trap is well made. Some have the fatal defect that the depression is not sufficient to cut off the air passage, and consequently affords no protection whatever.

Fig. 6.



2. If there is a suction in the sewer, and trap No. 1 is sucked out, air rushes in through the ventilating pipe and relieves the suction. Trap No. 2 remains unaffected. If there is an expansive force in the sewer, and gas is blown through trap No. 1, it passes off through the ventilating pipe. For the reasons already given, it *cannot* force the second trap when the ventilating pipe is open. So that, under any circumstances of suction or pressure, trap No. 2 remains in working order and protects everything behind it.

It might be asked, why not omit trap No. 1 altogether, inasmuch as it is the ventilating pipe, and not trap No. 1 that secures trap No. 2. It is perfectly true that trap No. 1 does not even aid in preserving trap No. 2; that is not its function. But it is not desirable that the ventilating pipe should at all times allow free escape for gases from the sewer. The function of trap No. 1 is to prevent this, and admit of the escape of gases through the ventilating pipe only under extraordinary circumstances.

As to the disposition to be made of the ventilating pipe, there exists a difference of opinion. Some advise to carry it to the pavement, others to bring it into the kitchen flue. In my opinion neither of these plans is desirable. The proper course is to carry it into the kitchen flue, and to continue the pipe up to and above the top of the chimney.

With these precautions the drainage of a house may be considered safe, with one exception, that the house drains themselves should be ventilated.

Ventilation of House Drains.—The arrangements already described for ventilating inside traps do not ventilate the drains themselves; nor does the ventilating pipe just above described. Their functions are limited to preventing the sucking or forcing of the traps to which they are attached. By the ventilation of drains is intended something quite different, viz., the establishment of a current of air through the drain pipes to prevent the collection of foul gases in them.

The necessity for such ventilation varies very much in different cases, and in this respect differs wholly from the foregoing precautions, which must be considered as indispensable in any case. A small house, the drainage of which is carried by a short pipe having considerable pitch directly into a sewer within a few feet of the house, may possibly not need to have its drains ventilated otherwise than as previously described. As the size of the house increases, and with its size the complexity of its drainage, the need of ventilation rapidly augments. Of late years it has been customary to build rows of houses with a drain pipe running in the rear, and making one connection only with the sewer for the whole row. At the present day it is probable that more houses are built in this way than with separate sewer connections. In such rows the main drain forms almost a small sewer in itself, and it and the whole system of pipes connecting with it should be ventilated. To a certain extent this result is unintentionally effected by the rain-water pipes, which tend to act as flues.

But the upper ends of these pipes are almost always in close proximity to windows ; those of back buildings to the higher story of front buildings, those of bay windows to the windows above, and in the very common case of mansard roofs the openings of the main-building rain-water pipes are close to the mansard windows. Consequently foul odours enter the windows in summer. To cure this evil, traps are probably put to the rain-water pipes, and thus the drain is corked up and ventilation stopped.

In the few cases where any express ventilation of drain-pipes has been attempted, it has been done by cutting openings into kitchen flues, and establishing a connection between the drains and the flue. This has always seemed to me a very dangerous proceeding. It is true that when the fire is allowed to go out in summer nights, it is *probable* that heat enough will remain till morning in the stack to maintain an upward current, but this is a poor dependence. When, however, the house is shut up for a period, this heat in the stack quickly disappears, and then the kitchen flue is precisely like any other opening. The house being closed up, all expansions and contractions must chiefly regulate themselves through the flues. Every change of temperature, and every barometric change, starts a current up or down the flues, and as often down as up. When the current is downward, the drain is freely ventilated into the house. Let anyone consider then, what condition a house is likely to present in the autumn which throughout an entire summer has had, during one-half of each day on an average, sewer gas freely poured into it.

How then shall the advantage of artificial ventilation be attained without this danger ? In place of carrying the connection simply to the kitchen flue, let it be carried by a stout iron pipe *to and above the top*.

This admirable plan, though mentioned in some of our latest text-books, has so far been but little adopted. The architect or the owner is too apt to think that when a pipe has been carried to the kitchen flue, all has been done that is required, and the device in this form has long been a favourite one ; the danger which arises from a temporary closing of the house is almost invariably overlooked or disregarded.

Carrying the pipe to the top of the chimney has every advantage on its side. Not only is the danger of escape into the house completely got rid of, but it is evident that the draft in the ventilating pipe must be greatly increased. For the pipe over the whole length is heated, and the lower part very considerably. A column of well-heated air, thirty or forty feet in length, must always give rise to a far more powerful draught than the comparatively slight force of suction produced by the draught of a chimney upon a lateral opening. Yet, as already said, this latter plan, although capable of little good and much mischief, is largely used, and the better method almost unknown. Probably this is in part owing to the very recent introduction of the better method, and in part to persons being unaware that the latter can be introduced without serious difficulty into

houses already built. As to this, the writer can speak from experience, having caused it to be introduced into chimneys in a row of houses on Broad Street, above Montgomery Avenue, in the city of Philadelphia, of which he directed the construction. After applying all the improved methods detailed in the course of this paper, it was concluded that the system would not be complete without a special plan for artificial ventilation of the whole system of drain pipes, soil pipes, and rain conductors. At the time when this decision was reached, the kitchen chimneys were already built. It was not, therefore, practicable to raise the iron pipe in sections along with the chimney; the much more serious problem presented itself of introducing a pipe into chimneys already built, and between thirty and forty feet in height. This was, however, found to be practicable. The plan adopted was to put a derrick on the roof, lower the pipe in sections, screwing each into the previous. The lowest section was bent horizontally at bottom. A hole was cut into the kitchen flue just over the range, the hand passed in, and when the lowered pipe came opposite it was seized and drawn through, and secured to the lower exterior portion. To render the return of any gas absolutely impossible, the following arrangement was made. On the top of the chimney a flat cap-stone was laid, with openings underneath for escape of smoke. The ventilation pipe was carried through a hole cut in the cap-stone, and continued six inches or more higher. A connection of this kind at both ends of the row and at several intermediate points must establish in each case a powerful upward current, and produce a slight exhaustion in the main drain, supplied by liberal currents of fresh air entering through rain water pipes and down soil pipes (with open ends above the roof), thus keeping the air in the drains constantly fresh, and dispersing the gases where they can do no harm.

These details have been thought worth mentioning here; partly, because they show the practicability of introducing a really effective drain ventilation into a house already built, and partly because they indicate an improved method of arrangement; it is believed that the plan of putting the ventilating pipe through the cap-stone, whilst the smoke flue ends below it, has not previously been described.

I have been asked, before concluding this paper, to discuss more particularly the result likely to follow an attempt to improve the sanitary condition of a house by connecting the drain with the kitchen flue, in the manner commonly practised and already condemned. The occupant of a house becomes solicitous about his drainage, and asks a plumber what can be done to render it safe, in a simple way. The plumber advises to attach a ventilating pipe to the lower part of the drain, and carry it to the kitchen flue, and recommends the plan as being cheap and effective.

As this mode of improving drainage has received a large acceptance, it seems worth while to study its results; and the first point that attracts

our attention is that, as respects the siphoning out of traps on the stories above, the great difficulty of modern plumbing, *it cannot exercise the slightest influence.*

To understand what influence it does exert, it is necessary to know whether or not an effective trap exists on the main drain. If there is no such trap, then the ventilation pipe simply ventilates the *street sewer* into the house. As long as there exists an upward draught in the kitchen flue, no evil result may be felt, but as soon as this ceases to exist, the house must be filled with sewer-gas, to a horrible extent, from the absolutely free communication afforded.

If, on the other hand, there exists a trap on the main drain in working order, the result will be different according as the plumber attaches his ventilating pipe on the sewer side or the house side of this trap.

If *on the sewer side*, the ventilating pipe will have the useful effect of preventing the trap from being either forced or sucked out by expansions or contractions in the street sewer. But this useful effect will be much more than counterbalanced by the house being placed in free connection with the street sewer, except as protected by the draught in the kitchen flue.

If the ventilating pipe is inserted *on the house side* of the trap, then the house will be defended against the sewer by both the draught in the kitchen flue and the trap. But in this arrangement the trap itself is no longer defended by the ventilating pipe, and is liable to be sucked or forced by the street sewer. If the trap is sucked out, then, as long as it remains in that condition, there is a free communication between the house and the street sewer, precisely as if there were no trap.

It is therefore to be concluded that this mode of ventilation is at best but a poor expedient. The most important object of all, the protection of the upper traps, it does not in the least effect. What of good it accomplishes in drawing off foul air from the pipes, is largely counterbalanced by the dangers it brings in case of closing up the house. And when sewer poison is thus introduced, it is quite impossible to say how long traces of it may remain in spite of the most careful ventilation. The sense of smell can give no information as to this point. It should be understood that when this arrangement is used, it is of vital necessity to provide a good S trap between the point at which the flue-pipe is connected with the drain and the street sewer. But the whole arrangement, even at its best, cannot be approved or sanctioned, and should be entirely abandoned. It is even probable, that whoever first introduced this expedient, had no clear idea of what he expected to effect by it, but had merely a vague notion of conducting foul vapours into the kitchen chimney; and those who now recommend it, do so simply because it has become a recognized form of proceeding which it is easier to adopt than to examine and study out. Such expedients might be excusable if the right methods

were not simple and practicable. These have been here already fully described, but may be briefly recapitulated: 1. Let the soil pipe be carried of full size and wholly unobstructed to and above the roof; *nothing* can take the place of this. 2. Let every water-closet trap be ventilated; every bath trap also, if it separately connects with the soil pipe; and let every wash-basin have a good bottle trap. 3. Let there be two good S traps, with ventilation pipe interposed (see Fig. 4) between the house and the street sewer. In this, and in no other way, can a house be made safe.

If space permitted, I should have wished to say something on the subject of the *selection of water-closets*. I must, however, limit myself to recommending the rejection of the old-fashioned "pan-closets," and the use of a good form of valve-closet in which there is no tilting pan. Forms of water-closet advertised as "requiring no trap," should either be avoided, or have a trap attached.

Finally, it may be said that in view of the vast amount of preventable mortality that arises from defective drainage, it is greatly to be desired that public opinion should be educated to the point of requiring from architects and builders a stricter compliance with the laws of sanitary engineering, and it is probable that much good might result from the passage of city ordinances compelling attention to some of the most vital points. Thus an ordinance requiring that every soil pipe should be continued of full size to and above the roof, and not be allowed to serve as a rain conductor; and that no drain should be allowed to make connection with the sewer without at least one well constructed trap, or better with two, as here described, would be of vast utility in improving the health of the poorer classes. Those who can afford better habitations, and who can think and judge for themselves, should insist on all the precautions briefly explained in this paper, as the indispensable conditions for preserving health.

ARTICLE XV.

GUNSHOT WOUND THROUGH BOTH HEMISPHERES OF THE BRAIN; RETENTION OF BULLET IN THE CRANIAL CAVITY; CONVULSIONS, RECOVERY, WITH PERSISTENCE OF ALL THE CEREBRAL FUNCTIONS. By P. F. HARVEY, M.D., Captain and Assistant Surgeon, U.S.A.

ON the night of November 18, 1878, at half-past nine o'clock, a letter was handed me by a courier from Poplar River, M. T., announcing the accidental wounding of Dr. G. A. S., Agency Physician of the Indian Agency situated at that place, sixty-five miles distant, and requesting my attendance as soon as possible. The letter was from Dr. W. Bird, the agent in charge, and stated, *inter alia*, that Dr. S. had received a wound in the

head that morning by what appeared to be a wandering rifle ball. I started at midnight, and availing myself of a relay which by good fortune I found at a half-way ranch, succeeded in reaching Poplar River at 10 o'clock A.M. the next day. I found Dr. S. suffering, as reported, from a gunshot wound of the brain, the ball having entered at a point $3\frac{1}{4}$ inches above, and 1 inch behind, the right meatus auditorius externus,¹ and ranged across through the cerebral lobes in a transverse direction towards the left supra-orbital convolution, as demonstrated by probing along the track of the wound which had been practised twice to the depth of five inches previous to my arrival. The missile which caused the injury, as definitely as I could ascertain, was a Winchester rifle ball of forty-four one hundredths of an inch calibre, and was thought by Dr. Bird to have proceeded from a neighbouring corral, where both whites and Indians were engaged in shooting cattle, by a ricochet from the head or horn of a beef. The patient who was seated in a buggy at the time of the accident, experienced no pain, and felt no blow on the reception of the injury, but remarked to a gentleman, who occupied the buggy with him, that one of their guns must have gone off prematurely, as he judged from a sensation similar to that produced by the report and concussion of a shot fired near the ear. Observing the flow of blood his comrade informed him that he had been struck. He complained of the sensation of seeing stars and of some confusion of ideas, but quickly regaining his presence of mind and realizing the situation he dismounted from the buggy and went to a wash-stand and washed the blood away. There Dr. Bird saw him and probed into the cerebral tissue in search of the ball, but failed to reach it. He was then carried to his room. Free hemorrhage followed the entrance of the ball into the cranium from division of one of the branches of the occipital or posterior temporal artery.

On my arrival I found him tranquil, with a perfectly unclouded intellect; pulse 50 to the minute; pupils normal; no hyper- or anaesthesia; no serious motor or sensory disturbance. He had felt a slight frontal headache, and experienced a peculiar twitching of the depressores labii inferioris et anguli oris on left side previous to my arrival. An ice bag was upon the vertex which it was advised to continue. Expectant treatment was counseled, with morphia, if needed to quiet nervous excitement, a guarded use of stimulants if necessary, and the use of cathartics and depressants to combat inflammation. The idea of trephining was discouraged, and only to be resorted to as a last hope. He improved rapidly, and I learned soon afterward that he was up walking about, and attending to some minor matters connected with his official duties.

Dec. 23. Dr. S. arrived from Poplar River this evening, having performed the whole journey in an open buggy since morning, alighting several times, and wading through deep snow drifts.

24th. Examined Dr. S. to-day. Aside from some debility consequent on the inactive life he had led for several weeks, he was to all appearances free from injurious effects of wound. Had borne trip well. Desired my opinion as to his proceeding down by mail wagon to Bismarck; was anxious to reach his family in Indianapolis. Not oblivious to the magnitude of the risk he would incur by such a journey, he nevertheless thought his future progress would be impaired as much by the constant mental anxiety he would experience at the agency as by the hardships he would

¹ Subsequently ascertained by exact measurement.

be subjected to on the journey. I was obliged to express doubts as to the propriety of the contemplated overland trip, and charged him to proceed with extreme caution, laying over at any stage where he might feel the need of rest.

26th. Dr. S. returned in a sled from Matthew's Ranch, twenty-five miles distant, having suffered two convulsions at that stage of his journey. The first convolution was ushered in by a loud subjective noise, like the ticking of a watch; by spasmodic movements of the fingers of the left hand which extended up the arm and soon became general (unilateral), involving the whole muscular system of left side. The first convolution, a mild one, was followed immediately after partial recovery from it, by a much more severe one implicating the entire muscular system, in which the body was bent forward, the knees drawn up, and the arms folded across the breast. States that during the greater part of spasm he was in a comatose condition, the owner of the ranch being the only person present. It lasted about ten minutes; was followed by free emesis, lassitude, and a chilly sensation of left side. Observed that the wound discharged a few drops of pus during attack.

Is much confused in intellect; has an exhausted and haggard expression; pulse feeble, 45 to 50 beats to the minute. Was admitted into the post-hospital. Enjoined perfect quiet and rest; ordered a bowl of beef-tea and a broiled venison steak.

27th. Slept well; complains of muscular soreness; to be rubbed with warm camphorated spirits.

28th. Improving; much more rational; pulse 60; tent introduced into wound. Patient sat up a while to-day; complained in afternoon of some tingling in fingers and toes, left side.

29th. Enlarged wound by incision; local anaesthesia.

30th. Pulse 60; experiences some subjective noises; feels weak; has been sitting up too much; ordered an ounce of whiskey with hot water; nutritious food.

Jan. 3, 1879. Was sent for in great haste this evening; found patient greatly agitated on account of certain tingling sensations in fingers and toes; and cold on left side. Potassium bromide, gr. xxx at once relieved the symptoms; two triplex pills at bed-time to relieve alimentary canal.

9th. Awoke at 2 o'clock this morning with ticking noise loudest in left ear; troubled with a feeling of nausea and a mawkish, disagreeable taste in the pharynx and fauces, accompanied by an aching sensation of throat. These feelings lasted about three-quarters of an hour. Had been sitting up almost all of the previous day writing letters.

11th. Experienced unpleasant symptoms last night: ticking in left ear; some anaesthesia of left hand and foot; slept poorly; wound almost closed, pin head opening only for pus. Enlarged scalp wound by a V-shaped incision and introduced silk for drainage; opening in parietal bone found to be reniform in shape about one-half inch in length and one-quarter in breadth, the convexity looking forward and downward, and long axis pointing towards coronal and lambdoidal sutures; projecting piece denuded. Employed local anaesthesia. Some depression after operation. Evening, 30 grs. potass. bromid. followed by an aperient.

12th. Slept well. Feels well. Showed me a notice of his death in the *New York Times* for December 30, 1878, and commented, laughingly, upon the novelty of reading one's own obituary.

February 12th. Patient has experienced no ill effects from the cerebral

lesion since last date ; drainage of wound has been secured by catgut and silk. All his corporeal functions have been discharged in a normal manner ; has gained about eight pounds in weight since admission to hospital. Has walked out on several occasions, visiting the trader's store, post, library, etc. States that he feels as well as ever.

March 17th. Complains of severe supra-orbital pain on left side, and some nausea. Tongue coated, and digestive functions somewhat disordered. Ordered potass. brom. to relieve pain, and the necessary corrigent for gastro-intestinal derangement.

18th. Pain has shifted to right supra-orbital region and back of wound ; superficial and neuralgic in character ; cathartic acted well ; to have two powders, 30 grs. each, of potass. brom. ; pain much alleviated by them. Feels some coldness of right upper and lower extremities.

31st. No symptoms of sufficient importance to require noting have appeared since last entry. Drainage has been kept up by introducing twice daily several strands of carbolated catgut. Cephalalgia, accompanied with furred tongue and constipated bowels, alarmed patient somewhat, three days ago. A cathartic conferred prompt relief.

Impending changes in the weather have been felt by frontal headache, slight stinging pains in wound, numbness in the ends of fingers, sometimes of one hand and sometimes of the other, and muscular soreness.

April 3d. The small denuded and projecting piece of bone became detached, and was discharged from wound.

5th. Drainage discontinued.

14th. Wound nearly closed.

May 2d. Patient left by steamboat for Bismarck, D. T., *en route* to his home at Indianapolis, Ind.

5th. Received a telegram from Dr. S. to-day. He arrived safely in Bismarck, feeling better than when he left here.

26th. Letter dated May 18 received from patient to-day. Reached home safely and in excellent physical condition.

Comments.—This case presents points of considerable interest as bearing upon the question of cerebral localization of function, as well as furnishing one of those rare cases of survival after the reception of an extensive cerebral lesion. A regional diagnosis of the injury can be pretty definitely made from the knowledge we have of the direction taken by the ball, and from the recent advances made in crano-cerebral topography. As stated, the tract of the lesion was probed by Dr. Bird on two occasions to the depth of about five inches, and its direction found to be diagonally forwards and across the brain towards the left anterior cranial fossa, slightly ascending. In accordance with the well known surgical principle, that where a ball has sufficient velocity to carry it cleanly through the cranium, if not escaping by a second opening, its momentum will be usually sufficient to transport it to the opposite side, it can be reasonably assumed in this case that the missile crossed the great longitudinal fissure, and found a lodgment in the first or second frontal convolution of the left hemisphere, having in its course passed between the cortical centres for movements of the face. By reference to the superficial landmarks necessary to determine the precise structure lying beneath, I find that the

wound of immersgence is situated immediately over the centre of the fissure of Rolando, and about 8 mm. above the upper limit of the central ganglia. From the obliquity of its course I judge the ball to have entered the ascending frontal gyrus just in advance of the scalp wound, and to have passed through the anterior portion of cortical motor centre on right side, which presides over movements of the left upper extremity, and not far from the centre for movements of elevators and depressors of the angle of the mouth. Undoubtedly the structures seated above, in which we find located the centre for movements of the opposite lower extremity, were somewhat implicated by virtue of contiguity. A review of the semeiology furnishes evidence corroborative of the virtual accuracy of the above. By reference to the foregoing clinical history we find that in response to my inquiry at the time I visited the Indian Agency, the patient stated that he had experienced very marked spastic movements of the depressors of the lower lip and angle of the mouth on the left side; and subsequently he informed me that the probe when first introduced, and when withdrawn, caused a notable increase of these movements, evidently from irritating the centre just named. We should remember that a destructive lesion may be an irritative one, and produce spasm instead of paresis.

The above was the only motor symptom caused by the injury until December 25. On that date, after a fatiguing ride of 90 miles, accomplished in two days, he suffered a convulsive seizure which after lasting a short time abated, to be followed by an exacerbation. During the early part of this seizure the patient was conscious, and asserts that the disturbance of the motor functions was confined wholly to the left side of the body, but as the disorder increased he became unconscious, and was wholly dependent upon the owner of the ranch for information as to the parts of his system affected. He was told that the whole body was involved. This diagnosis could be fairly questioned, as proceeding from a witness unacquainted with the phenomena of eclampsia, frightened and confused in its presence, and hence incompetent to pronounce with any accuracy upon its clinical features, were it necessary to assume that the spasm extended itself chiefly or wholly upon the left side. But we have good reason for believing that the motor disturbance extended to the right side. Authorities in cerebral pathology (Brown-Séguard, Bastian) assert that indirect symptoms proceeding from parts remote may be produced by the primary lesion by reason of textural or functional relationship (reflex) by pressure, by inhibition, or stimulation, and Callender states that convulsions particularly attend lesions of that part of the right hemisphere which is above the corpora striata, exactly the one present in the case under consideration. Or pressure from retained pus in the lesion on left side involving the anterior part of first or second frontal convolution (non-excitible) might have been exerted upon excitable structures behind (internal capsule, centre for face, etc.). In fact the wound for the first time in

several days discharged a few drops of pus during the convulsion, and the lowering of intra-cranial pressure consequent thereon was followed by a cessation of spasm. The element of exhaustion must not be lost sight of in this connection. Patient was greatly fatigued on reaching the ranch, and the subjective tickling symptomatic of this state was the first warning of the attack. The fatigue I regard not in the light of an efficient cause of the convulsion, but as contributing towards its occurrence by placing the patient in a condition favourable to its development; in other words acting as an exciting cause, the encephalic breach constituting the predisposing cause. Meningeal irritation is capable of inducing spasm, but there is no evidence that it operated among the causes producing it in this instance.

It is not unlikely that drainage of the wound practised subsequent to patient's reception in hospital, acted to obviate tension of the hemispheric textures and the consequent occurrence of spasm. We find, however, that after admission he experienced at various times sensory symptoms referable to the left side and extremities, such as tingling and anaesthesia of fingers and toes, and a feeling of chilliness, a disagreeable taste in the pharynx and fauces accompanied by an aching sensation of the throat, etc. These were slight and transitory, and are explicable, although the aesthesodic area of internal capsule had sustained no lesion, on the grounds already given, *i. e.* by reflex action, pressure, etc. Or they might be viewed as the initial signs of, but not progressing to, the graver symptoms that go to make up the *tout ensemble* of paralysis or convulsion.

No psychic symptoms further than noted in history under date of Dec. 26, have shown themselves, even of the mildest grade. Patient's mind and disposition have suffered no change. The temperature taken for some weeks after admission ranged between 98.5° and 100° F.

Six months have now elapsed since the unfortunate accident happened, and no symptoms have shown themselves to indicate that there has been any advance of the injury into other parts of the brain. On the contrary the patient's progress seems to warrant the conclusion that progressive repair has been taking place, and to justify the hope that his tenure of life may not be materially curtailed. I am aware that wounds of the motor fasciculi of the internal capsule are said to be infallibly followed by descending secondary degeneration (Wasting Palsy, Curveilhier's), and that such a wound has been sustained in this case there can be no question. Not the slightest symptom apparent to me, however, yet points to its commencement, although the fibrillary contractions and localized muscular atrophy characterizing it are slow in showing themselves, and sufficient time may not have elapsed for their development.

It is almost needless to state that in injuries of this nature, with retention of ball, a prognosis must be given in an exceedingly guarded manner. The foreign body never becomes a harmless tenant, its presence always

furnishing a potential source of mischief, and recovery can only be held to take place in a limited sense, for notwithstanding the absence of symptoms, speedy dissolution may ensue with little or no preliminary warning.

Prof. Podrazki, in some interesting general observations with which he prefaches the narrative of a case of gunshot wound of the brain,¹ has recorded several of the various fatal complications that may be set up by the presence of a bullet in the encephalon. Years may elapse and still death take place from an apoplectic attack or by progressive asthenia. Acute encephalitis or meningitis (arachnitis) may occur, and this happens in the majority of instances, death resulting from cerebral compression due to the formation of pus, or from pyæmia. Chronic encephalitis may induce a condition of cerebral hyperæmia, which our best authorities in psychopathology mention as an important factor in the production of dementia or mania. (*Vide Winslow on the Brain and Mind*). Central abscess may give rise to fatal coma or convulsions, or may cause sudden death when all appears to be going on well. This was exemplified in the case of a soldier from the Italian war who, when admitted to hospital, informed the surgeon that he had a ball in his head. His pulse was only 44, but his symptoms otherwise were favourable, and his case was apparently progressing towards recovery when at some time afterward, how long it is not stated, he suddenly fell down dead. A post-mortem examination revealed a bullet lying in an abscess in the anterior lobe of the brain. Longmore, Guthrie, and others, record analogous cases occurring among soldiers. Again, a bullet may gravitate toward some vital part in the brain, and reaching it, immediately cause death; or it may gain the base of the skull and there remain for years without causing injury; or it may be eliminated. The latter, however, is of extreme rarity. At a meeting of the Clinical Society of London on Tuesday, October 11, 1878,² the remarks following the reading of a paper by Mr. Lucas on *Bullet Wounds of the Skull* are of interest in this connection:—

"Mr. Hulke recalled a case under the care of Mr. Lawson where the bullet, or leaden plug, was found at the bottom of a large ragged hole in the forehead, in a mass of brain. This man never had a bad symptom. Mr. Heath mentioned a case where a man put a pistol close to his head. He was not killed but rendered completely blind. No bullet could be found but there was a slight prominence on the opposite side of the head from the point of entrance. The man's health was still good. Mr. Barker mentioned a case which he had seen where a Chassepot bullet had struck the forehead and buried itself in the brain. After living for months the patient died convulsed and comatose. Mr. Hulke said Larrey had written of the case of a man who survived after a bullet passing clean through the brain, so that a probe could pass through. Mr. Howse had had a case somewhat similar, only the result was fatal. Here the bullet passed right through. He cut down and found the bullet. Mr. Hutchinson referred to an interesting specimen in the Leed's Museum, being the skull of a woman who was not known to have received any injury, but in whose sphenoidal fissure a

¹ Am. Journ. Med. Sciences, April, 1872, quoted from Wiener Med. Wochenschrift, Dec. 9-16, 1871.

² British Med. Journ., October 19, 1878.

bullet was found when she died of fever. The President (Mr. Callender) said much injury might be done to the brain, and yet nothing particular happen. Injury to the convolutions did not seem greatly to matter if the *debris* was carefully removed. Mr. Norton spoke of a person now alive on whom craniotomy had been performed, and was put on one side for dead. He was not more stupid than the bulk of agricultural labourers. Mr. Lucas said the anterior lobes of the brain might be injured without any marked result following."

Mr. Fairlie Clarke exhibited to the Pathological Society, of London, November 2, 1869,¹ a boy aged 12, who had sustained a severe injury of the anterior convolutions without impairment of intellect or power of speech, and other members referred to several cases of like injury in which there were no marked cerebral symptoms.

It is proper perhaps that I should add a fact not mentioned in the history of the case, namely that the instrument used in probing for the ball prior to my seeing the patient, was a grooved director, a circumstance which adds to the remarkableness of the subsequent favourable progress. The practice so common of probing the brain in search of bullets, cannot, I think in the light of modern surgical experience and teaching, be regarded in any other manner than as superadding increased danger to the life of the patient, for it can be readily perceived that the probe in exploring the tract of a lesion through the soft mass of the brain, might unwittingly be passed into the uninjured portions, and reaching an important centre cause speedy death. The use of the trephine for the removal of balls unless they are known to be quite superficial, according to our best modern authorities is unwarrantable practice, the expectant mode of treatment yielding the best results. The probing of the brain becomes therefore a useless as well as a pernicious procedure. Incision of the integuments and removal of superficial debris is good surgery, and when we add to that the elevation of depressed bone for the relief of urgent symptoms we sum up about the only modes of operative surgical action that promise to yield curative results in penetrating wounds of the cranium.

FORT BUFORD, DAKOTA TERRITORY.

ARTICLE XVI.

REPORT OF A CASE OF MALIGNANT TUMOUR OF THE ABDOMEN, GREATLY RESEMBLING, AND EVEN MISTAKEN FOR, ONE OF EXTRA-UTERINE PREGNANCY. By WALTER F. ATLEE, M.D., of Philadelphia.

I WAS asked (on April 21) to see Mrs. M—, residing in this city, in consultation with Dr. B—, a well-instructed conscientious man of quite considerable experience, to whom I had recommended her as a good obstetrician. She had been to my office in October last, to ask me to attend

¹ Lancet, November 13, 1878.

her in her confinement, which I then thought from her statement and her appearance, would take place in the early part of January. Dr. B— said that the patient's case was a perplexing one to him ; he thought the woman to be with child, the parts of which he could distinguish by the touch through the vaginal and abdominal walls, and that the child was outside of the womb, and had been dead for several months. She had been visited by several physicians, who had been unable to reach any positive diagnosis in the case.

Mrs. M— was twenty-eight years of age ; had been married three years, and had a child two years old, that she suckled until last November, when she weaned it, believing herself again pregnant. After the birth of this child she had never had any menstrual flow. Last June she noticed on the right side of the belly, low down, a hard lump, which had constantly enlarged ; her general health continued quite good, with the exception of occasional attacks of nausea, until about Christmas, when she began to emaciate, and to feel her strength diminishing. When I saw her she was very thin and weak. There were no symptoms of poisoning from purulent or putrid infection. The belly looked and felt like one in which there was a child, surrounded by very little amniotic liquid ; the projections to be felt in the mass while the hand was pressed over the surface, were very similar to what are felt in such a state of things. In the vagina a hard mass was felt, in size and shape like the foetal head, and in front of it was the mouth of the womb pressed against the pubes. The uterine probe entered two and three-fourth inches. In the peritoneal cavity there was an amount of fluid, quite sufficient to enable one to feel its fluctuation when percussion was made in front of the belly.

Near the angle of the lower jawbone, on the left side, was a lump the size of a pigeon's egg, hard and immovably attached to the bone, that had been there, the patient said, for two years ; on the top of the head was another the size of a chestnut that appeared two and a half years ago ; in the neck, above the clavicle, was one that had been there for five months ; on the back of the head was another, as large as a chicken's egg, that made its appearance only three months before ; and there was a fifth near the right hip. These lumps were absolutely free from pain ; hard, firmly attached to bone, and having the skin loose over them. The peculiar enlargement of the belly, and the absence of the menstrual discharge¹—in all cases the most important of the signs of pregnancy—were the chief reasons in this case for supposing the patient to be carrying an extra-uterine foetus. Of all the symptoms, rational and sensible, presented by pregnant women, only these two existed, or had existed. Those peculiar to extra-uterine pregnancy in its various forms, the passage of the decidua with hemorrhage, the violent colicky pains, etc., were all missing.

Under these circumstances there could be no reasonable doubt that the case was one of cancer of the abdominal cavity, and of ovarian origin, as such cases almost always are. To be doubly sure, to make certain that the case was not one of extra-uterine foetus, but was one of malignant tumour, an exploring trocar was introduced through the linea alba, and all the liquid that could be extracted, measuring just one pint, was collected.

¹ The aphorism of Hippocrates, section v., 61 : "When a woman has not her menses, and has sickness of stomach, without chills or fever, believe her to be with child," very generally holds good.

It is a fact of great importance that ovarian tumours of a malignant kind are generally surrounded with ascitic fluid, and if the ascitic fluid is tinged with blood, this circumstance is a very suspicious one.

It is not true that all ovarian tumours surrounded with ascitic fluid are malignant, but it is true that malignant ovarian tumours are generally surrounded with ascitic fluid. It is said by some observers that an examination of the fluids from an ovarian tumour by tapping, will often inform us if the tumour is malignant; but most of the malignant tumours of the ovary are semi-solid. It is to the ascitic fluid we must look in doubtful cases.

Dr. James Foulis, of Edinburgh, was the first to direct attention to the subject of peritoneal infection from malignant ovarian cysts, and the first to describe characteristic cell-groups found in the cystic and ascitic fluid. These cell groups when found in ascitic fluid are not diagnostic of any one form of tumour, but of the *malignant condition* of the tumour in question, and of the peritoneal membrane. Dr. Foulis demonstrated that at no stage of its existence has the ovary any tubular structure, and that the eggs and the follicular epithelial cells have a different origin. The cells of the membrana granulosa are derived from the connective tissue corpuscles of the stroma, and the knowledge of this fact enabled him to detect the connection between the cell-groups in the cystic and the ascitic fluids and the diseased ovary and peritoneum. The stroma of the ovary is derived from, and is directly continuous with the structure that he calls the stroma of the peritoneum, which is remarkably rich in lymphatics, that pass into the ovary at its hilus, and ramify throughout its entire extent. He showed that a diseased ovary may affect the peritoneum in two ways; by shedding from its broken surfaces cellular elements, which settle down on the peritoneal membrane, and in many cases take root and grow; and by the passage of seeds from the malignant tumour along the lymphatics to all parts of the serous membrane.¹

The colour of the liquid collected in the case narrated above was yellowish-green, the specific gravity 1017; it was very albuminous, coagulating quickly, both by nitric acid and by heat. The test-tube could be turned upside down without losing its contents. On being allowed to stand, there was a light flocculent deposit in the form of a cone, below this a denser flocculent precipitate, arranged horizontally, and a still denser precipitate, of a reddish colour, below that. Microscopical examination of these precipi-

¹ The very valuable papers of Dr. Foulis above referred to, are published in the *British Medical Journal* for June 26, 1875; in the *Edinburgh Medical Journal* for August, 1875; and in the *British Medical Journal* for November 2, 1878. It is certainly surprising that Mr. Spencer Wells should omit all mention of the name of Dr. Foulis, in his Lectures on the Diagnosis and Treatment of Abdominal Tumours, delivered last year before the Royal College of Surgeons of England, and give the credit to Mr. Thornton of the discovery of these cell-groups.

tates showed large numbers of red blood-corpuscles, epithelial scales, large cells, six or seven times as large as a red blood-corpuscle, with large nuclei, and nucleoli. There were large masses of these cells, proliferating in a most extraordinary manner, as described by Dr. Foulis; from a minute solid nucleus, invested with protoplasm, up to large free nucleated cells, with bright, sharply-defined oval nuclei, with nucleoli, all stages of cell development, could be seen in each mass. The discovery of these masses of cells left no longer any room for doubt, had there been any before, of the true nature, in this obscure case, of the tumours in the abdomen.

ARTICLE XVII.

AN OLD NEURALGIA CURED BY AN OPERATION. By JNO. T. KING, M.D.,
of Baltimore, Md.

MR. W. J. H., act. 48, merchant, slender and pale, has enjoyed good health, with exception of repeated attacks of neuralgia. Devoted to an extensive business, with little time for recreation; of perfectly temperate habits. When quite young he fell, striking the frontal bone, and depressing to a considerable degree the outer tablet. Included in the cicatrix which remained was the supra-orbital nerve at a point about an inch above the supra-orbital foramen. The tissues were firmly bound to the depressed bone. From his own statement, as well as that of his parents, we are unable to say positively that neuralgia followed the injury immediately, though we know nothing to the contrary, as both were established so early in life; though I think the sequel will demonstrate that the neuralgic affection followed the injury as cause and effect.

Since early boyhood, however, he has been a martyr to neuralgia; scarcely a day passed in which he did not feel more or less pain over the right hemicranial region. At times he is almost distracted, suffering intense agony for days; the least exposure insuring an attack.

He came under my professional notice about a year ago; the usual remedies were resorted to. Quinia, in large doses, and other alkaloids of cinchonia, salicylic acid, iron, strychnia, arsenic, belladonna, chloroform, etc. etc., were faithfully tried, and in various combinations, without affording more than temporary relief. I thought an operation justifiable, though I hesitated to promise permanent relief. He appeared anxious that surgical means should be resorted to. In consultation with Dr. Winslow it was determined to operate at once. Dr. Winslow inserted a narrow bistoury at a point about $\frac{3}{4}$ inch below the cicatrix, and carried it subcutaneously to about the same distance above, dissecting up the integuments from the pericranium. A tent was introduced through the wound, and retained *in situ* for ten days. Complete relief followed the operation. Though nine months have since elapsed, there has been no return of the neuralgia. Mr. H., feeling such confidence in his cure, has intentionally exposed himself, thus tempting an attack, but none followed. His general condition has likewise improved, as would be expected.

REVIEWS.

ART. XVIII.—*The Principles and Practice of Gynæcology.* By THOMAS ADDIS EMMET, M.D., Surgeon to the Woman's Hospital of the State of New York, etc. With one hundred illustrations, 8vo., pp. 855. Philadelphia: Henry C. Lea, 1879.

IT is safe to assert that no medical work has issued from the press for many years, the appearance of which has been awaited with so much interest as this. The explanation is not difficult. The long connection of the author with the leading woman's hospital of the country, his well-known devotion to his chosen branch of practice, the great practical value of the numerous contributions he has from time to time made to the floating literature of the subject, and the sterling merit of his work on vesico-vaginal fistula, all conspired to excite anticipation as to a complete and standard treatise from his pen. We chronicle the appearance of the work with pleasure, and tender to the author our congratulations on the completion of his task. In attempting to discharge the duty which has devolved upon us we are impressed with a sense of responsibility proportionate to the great and general interest which is felt in regard to the work, and wish it had been committed to other and abler hands. Nevertheless, we make the attempt to present to our readers the results of a careful examination of the book, or at least to give such an account of it as will enable them to judge as to how far the author has realized the aim announced in the opening lines of "representing the actual state of gynæcological science and art."

We will begin by stating what we believe to be some of the general leading characteristics of the work.

First of all, it is pre-eminently an original book. This does not apply merely to novel operations described, or new methods of treatment directed. Even the preface bears the marks of individuality and independence of judgment, both as to manner and matter, and the reader will not advance far into the body of the work before he discovers that it is written by one who has a mind of his own, and who is not in the habit of going beyond himself for the sources of his knowledge. It is a work based upon a vast amount of clinical experience derived from twenty-five years of constant service in the New York Woman's Hospital, from sixteen years management of a private hospital, and a large consulting practice. It is, therefore, a practical, as well as an original book, and the originality of its measures of treatment is derived from experience, and not from theory, a fact to be kept duly in mind whenever doctrines are advanced to which we cannot assent, or remedies prescribed which may not agree with other authorities.

Closely connected with this feature of the book, and naturally consequent upon it, is the tone of authority in which it is written. The author assumes the position and the tone of a master, and since his large experience justly gives him the right to do this, we will not complain, although at times it leads him to dogmatize, and occasionally we find him austere.

The book is written in no narrow spirit of specialism, but upon the broad ground of science. Thus, in the preface, giving his reasons for the very wise course of excluding formal prescriptions, he says:—

"No man can prove successful as a gynaecologist who has not mastered the principles of medicine, and stored up experience in the general treatment of disease." Again, he says: "For the successful treatment of these diseases, a more general and accurate knowledge is requisite than in the practice of any other branch of the profession;" and "the advocate for either general or local treatment exclusively, or he who neglects to give the proper attention to both, does not possess sufficient practical knowledge to extend his usefulness beyond the range of an empiric."

A prominent feature of the book is the tabulated statement of facts relating to the subject of the various chapters. There are no less than sixty-two tables of the particular features and co-related symptoms of different diseases or conditions. To give a more accurate idea of this very notable feature of the work we may state that in regard to fibrous tumours twelve tables are given, and these set forth and show the ages at which the subjects of these tumours were first examined, their average age, the age at puberty of those thus affected, the number of unmarried, sterile and fruitful, the regularity of menstruation as affected by fibrous growths, the pain suffered at different periods of the flow, the connection between regularity of menstruation and degree of pain, the duration and quantity of the loss of blood, and many other particulars. In the chapter on Menstruation there are also twelve tables, presenting the facts, in various relations, derived from two thousand three hundred and thirty women treated in private practice, and in the chapters on Cellulitis, Versions, and Flexures, the same method is pursued. The accuracy of these tables is vouches for by being the personal work of the author. Their value is not to be estimated by the bearing they have upon practice, meaning by practice the administration of drugs. As positive and reliable contributions to our knowledge, and as furnishing data for future use in the study of these subjects, too high an estimate cannot be put upon them, and Dr. Emmet's claims will be cheerfully admitted that "their parallel is not to be found in the whole range of gynaecological literature."

Minuteness and precision of direction as to methods of treatment, and inculcation of the most scrupulous care after operative procedures, are a peculiar feature of the book. It will doubtless surprise many to read the precautions that are to be observed by the patient during the application of a sponge-tent, she not being permitted, *under any circumstances*, to get out of bed. Nevertheless, prudence has been taught, the author states, by unhappy experience, and time only confirms him in the necessity for caution. Even the state of the weather at the time of resorting to dilatation with tents is to be considered.

"The nervous system of a patient will be less taxed, and the power of endurance greater on a clear day. Moreover, experience has taught me that in a state of the atmosphere favourable to an active condition of the skin, there will always be less danger from blood-poisoning. I have also been impressed with the conviction that the occurrence of cellulitis is a far more frequent sequel to the use of the sponge-tent, when employed during the prevalence of damp, cold, and easterly weather."

After operations the treatment of the patient is directed on the same plan of extreme caution, of which the care of a case of incision of the cervix, as given on p. 360, may serve as an example. The author well says

that "many a brilliant operation has failed, and even entailed disastrous results upon the patient, for the want of this care in the after-treatment."

So we also find, not only minute directions for such an important matter as properly plugging the vagina, but for the administration of a foot-bath and the making of a mustard plaster. For the patient such minutiae are not overlooked as the arrangement of the pictures and furniture of the room and the wearing of a neck ribbon; and for the physician, the care of the finger-nails is shown to be one of the great little things; in the introductory part we are told that they should be kept short and clean, and in the chapter on Ovariotomy the very strong language is used that "the death-warrant of many a patient is carried under the nails of the operator."

Whatever may be the measure directed or operation described, the particular manner of its execution is emphasized and insisted on; that way, and that way only, ensures success. No one can complain of this. If a man's methods of treatment are to be tested, it is only just and fair to demand that his directions be scrupulously followed. Still, we think we can point to places in this book where the impression will be conveyed, although without such an intention on the part of the author, that it is very difficult to follow all the minutiae of direction, and success consequently will be hard to attain.

Finally, the strongest instance of the estimate placed by the author upon the most scrupulous attention to every point, finds expression at the close of the chapter upon the principles of general treatment in the following language:—

"The successful physician or surgeon is eminently noted for his personal attention to details. . . . The purpose of this chapter has been, and the object in view throughout the work will be, to impress the reader with the fact that *success in the treatment of the diseases of women lies wholly in attention to minute details.*"

Entering now upon an examination of the work, we find that the first chapter is on the relations of our climate, modes of education, and social conditions upon the health of our women. It is a most excellent chapter, one which we wish had been extended to thrice its length, and that then it could be printed as a health tract, and scattered broadcast through the land. There is no sort of doubt that our climate, with its great lack of moisture (away from the sea-board), with the severe cold of its winters and the intense heat of its summers, with its rapid and great variations of temperature at all seasons, is a most trying one, especially to the delicate nervous organization of females. In addition, we have over a vast expanse of the interior of our country the ever-acting and insidious but powerful influence of malaria, depressing nervous force both voluntary and organic, interfering with nutrition, and the direct cause of many forms of local disease. "Malarial congestive hypertrophy" we find recognized in the work, and it is frequently the pathological cause of menorrhagia, as is well known by those practising in malarial districts. We fully agree with the author in his estimate of our climate, and cannot think that criticism just which would arraign him for holding the opinion that it is one deleterious to the health of women.

The customs of our people in bringing up children justly come in for animadversion. Truly, American children are fearfully and wonderfully brought up, and are looked upon with amazement by all foreign visitors from civilized countries. The evil effects of indulgence and want of restraint begin, of course, with the earliest years, but it is only to the period of

girlhood and the passage into womanhood that our author applies his remarks. "With the first step to womanhood the young girl begins to live an artificial life, as a tribute to a degree of civilization and progress which is only consistent in a general disregard of all the laws of health," and the attractions of society are allowed to dazzle her, and its dissipations to sap the foundations of her strength before the mind is mature enough to carry her safely through the one, or her body sufficiently developed to bear with impunity the other.

Our system of education comes in for its share of just rebuke. Throughout all the Eastern, Northern, and Western States public instruction has been developed into a vast and complicated system, giving employment to a large army of teachers, who, impelled by professional pride, and with the most laudable aims, have pushed their demands upon the scholars under their care beyond the limits permitted by hygienic law. To such an extent has this been carried, that it has aroused the attention of the profession, and in many quarters they have made vigorous efforts, and still more must be made, to correct the abuses which have crept into the system. The works of the late lamented Dr. Edward H. Clarke, of Boston, will occur to every one in this connection. The author alludes to them with praise, and confirms in the strongest manner the evil effects of excessive study during the period of active sexual development of girls.

"On looking over my case books, I have been surprised to find the same statements repeated again and again, viz., that the sufferer had taken the highest honours at some noted female school or college, and gave no tangible signs of weakness until reaction took place after her return home."

Within a year past the writer of this was called upon to deliver a lecture before an association of teachers upon some points of school hygiene, and took occasion to enforce the physiological law that two organs of the body could not be simultaneously pushed in development without injury to one or the other, and stated that the medical profession would never be satisfied until, in every girl's course of education, there was a break of a year, the particular time to be chosen by the mother. The position was assailed by some of those interested as entirely impracticable, as interfering too seriously with education to be entertained for a moment. What they will say now to the author of this work we cannot imagine, since he claims that

"to reach the highest point of physical development, the young girl in the better classes of society should pass *the year before puberty and some two years afterwards* free from all exciting influences. . . . Her mind should be occupied by a very moderate amount of study, with frequent intervals, of a few moments [months?] each, passed, when possible, in the open air. *There should be no studying at night under any circumstances.*"

It is the medical profession that must correct these abuses in our forcing system of education, which we are convinced, which we know from actual observation, is doing much to sap the strength and undermine the health of our growing girls, and the profession may thank Dr. Emmet for his powerful influence in aiding them to awaken public attention and influence public opinion.

The three following chapters are upon instruments and modes of using them, with directions for examining and recording cases, and are profusely and well illustrated. The author here sets forth his well-known predilection for the scissors as a cutting instrument in all operations about the genital organs. His remarks upon digital examination are excellent;

"to detect slight changes, it is equally important to realize the fact that the lighter the touch the more thorough will be the appreciation of the sense."

Rectal examination is inculcated as indispensable, not only as enabling the examiner to reach a portion of the pelvis inaccessible from the vagina, but as affording information as to the state of the bowel itself, in diseased conditions of which all the pelvic symptoms may have their origin. Simon's mode of examination, by introduction of the whole hand, is not indorsed, as it is believed as much information can be gained by fingers, while the proceeding is not without risk. For the same reason, a risk out of proportion to the value or amount of information gained, he rejects digital examination by the urethra. In regard to the use of the uterine sound, there has heretofore been but one caution impressed upon the student, to avoid resorting to it when there is a possibility of pregnancy. Another is added here, the existence of cellulitis, a pathological condition to which the author attaches the highest importance, and one which the use of the sound might awaken from a latent condition into dangerous activity. The utmost care is inculcated upon this point; to overlook the existence even of a slight cellulitis is culpable.

"Many a poor woman has had to suffer from the carelessness of her physician in overlooking a latent cellulitis, and endured years of bad health, and often permanent sterility, from this disease being rekindled by the unskillful use of the probe or sound, and extending beyond the limits of the first attack."

The following chapter is, in title, etiological, in substance largely pathological, and affords us a view of the principles which form the basis of the author's treatment, and presents some points of difference from current theoretical doctrines. The origin of all diseases of the generative organs of women he finds in the sympathetic nervous system, the great regulator of the circulation and of nutrition. This nervous system in perfect action, we have health; this deranged, and we have disease. The derangement affects nutrition, and impaired nutrition is the chief and most active pathological factor for our consideration, since with this impaired healthy nerve force cannot be generated. Faulty nutrition is either congenital or acquired, and consideration of the latter affords another opportunity of showing the evil effects of "building up a brain out of season" by forcing intellectual development at a time when nature says that sexual development shall go on. Faulty nutrition produces derangement of the circulation, and this derangement is congestion, and this congestion is venous congestion, not arterial.

"Arterial congestion, the result of some local irritation, is a condition always temporary in duration when the reparative powers are in a state of integrity."

"It is necessary at the outset to appreciate the marked difference between passive congestion, which is generally [always?] venous and inflammation. These terms are usually regarded as synonymous, but erroneously so, as are many in connection with uterine disease."

We know that the *conditions* have been confounded, but do not know by whom the terms "passive congestion" and "inflammation" are considered synonymous.

The next step to this is a denial of uterine inflammation entirely, except in the puerperal condition. This is done explicitly and positively (p. 81), and is repeated on p. 259 and elsewhere.

"Inflammation cannot exist without molecular death, and its products are easily recognized until absorbed. We may look in vain, after death, for any evidence of an existing endometritis, so called, or for an ulceration of the cervix, as it is termed, for neither of these conditions is inflammatory."

The denial extends not only to the infarcted condition of the organ, known formerly as chronic metritis, and for which many different terms, among them hyperplasia, have been proposed, but also to the internal surfaces of the organ, and we are to be done with "internal metritis" whether corporeal or cervical. It is scarcely fair for the author to add that "the facility for locating its limit exclusively to the cervix, body, or fundus, rests only in the brain of the theorist," since we know of no one who dots out these distinctions with any other view than that of aiding the student to master the subject, or to show him that the affection of one part may predominate over the other; or who does not teach, with the author, that "it will be but a question of time before the whole canal becomes equally involved."

It is in the connective or cellular tissue of the pelvis that the author finds the source and origin of the greatest number of ailments of the female generative system. Pelvic cellulitis, pelvic peritonitis, and haematocele, this is the order of frequency in which diseases are placed, and in the first is found the cause of symptoms which are too frequently attributed to the uterus or ovaries (pp. 90, 259). More of this will be found in other portions of the book and recurred to.

The extension of morbid influence from the ganglionic system, the great regulator of nutrition and of the reproductive organs, to the cerebro-spinal system, or, in other words, the origin of what are termed "nervous" symptoms and manifestations, is most excellently sketched, and should be read and reflected on by every student and practitioner. Hysteria and its congeners only make their appearance when the nervous energies are unexpended by active occupation, or have long run in the vicious channels of self-indulgence or forced excitement. She who is compelled by circumstances to healthy occupation escapes, the idle and the luxurious suffer. Those who have been trained to exercise moral restraint resist the morbid influence which is manifested in an exaggerated degree in "those in whom that sheet anchor of womanhood is lacking, a devotion to duty and a healthy sense of moral obligation." We wish that every parent and every instructor of youth could have these facts impressed upon them.

The chapters upon the general principles of treatment will be found as interesting reading as any in the book. To improve nutrition, to correct anaemia, to restore tone to the vessels of the pelvic organs and cellular tissue—these are the objects to be kept in view. First of all the patient is to be freed from the pernicious influence of anodynes, alcohol, and coffee. These are "insidious poisons to the nervous system," and the author places no insignificant estimate upon their influence in rendering recovery impossible; they must be banished; no compromise is to be entertained. We cannot deny the statement that there are many instances in which the habitual use of stimulants have become a confirmed habit from the culpable error of physicians in ordering them. Still, we hear the charge made much more frequently than truth will warrant, for it is the easiest and readiest excuse for the victim to plead in the effort to transfer the blame to other shoulders than his or her own. Moreover, the young practitioner should remember this: if alcohol in any form is ever prescribed upon any occasion, that one prescription will be extended by the patient,

if at all so inclined, to cover the whole of life. A resort to anodynes for the ordinary ailments of woman is most strongly discountenanced and denounced. There are three occasions for their use: in inflammations, after operations, and in malignant diseases. These are the only circumstances in which they are demanded, and to administer them frequently is to make a general wreck of the nervous system.

"In private practice the case becomes almost a hopeless one from the hour that the patient becomes dependent upon the use of an anodyne."

The hypodermic method, from its seductive facility, comes in for the strongest condemnation:—

"The inventor of this method has given, I fear, a curse to the human race instead of a blessing. I may be deemed prejudiced, but I have long felt that the medical profession is largely responsible in the abuse of this instrument for the wide-spread existence of the opium habit. This vice is increasing so rapidly all over the country that we shall, to our sorrow, at no distant day, rival the Chinese in the consumption of this drug."

In the absence of statistics we cannot deny the statement; still, we believe the picture over-drawn, and the charge against the profession too sweeping. The caution against a too ready resort to direct anodynes is, however, needed and well put, and should be carefully remembered by the young practitioner.

The first step in direct treatment is the gain of the patient's confidence by the physician. This, and the exercise of moral control, and the influence of the stronger mind of the man over the more dependent and confiding mental organization of the woman are justly estimated as of the highest value, indeed, as indispensable in the successful treatment of this class of diseases. The examples given of this kind of treatment are marked, but doubtless true to the letter. It will immediately occur to the family practitioner that he cannot bring to bear upon his patient such heroic and apparently cruel measures, and the objection is just. In this respect the consulting physician enjoys a power, the direct result of his position, which the home physician cannot exert, a fact the author duly recognizes. Nevertheless, it should be borne in mind that the principle is the same everywhere, and the instruction worthy of being followed as far as it possibly can be under all circumstances. The same mental method of treatment is brought to bear in the chapter on hysteria, to which we shall not refer further than to regret that it was not extended to a length more proportionate to the importance of the subject and the frequency with which the disease comes under medical care. Here, while showing the efficacy of mental influence and the power for good of disagreeable remedies, we are surprised that the author has omitted to say anything as to the use of cold water, since it is inferior to none, and is directly in line of his favourite treatment. A heavy douche poured over the upturned face of the patient, administered without mercy, will not be long continued before the most violent fit of hysterical convulsion finds its end. Moreover, an order to "bring on the tub again" will promptly prevent a threatened paroxysm.

Food, bathing, sunlight; these are the next remedies. The manufacturers of pepsine and artificial digestives will find but little comfort from the statement that digestion can at first be aided very little by the use of medicines. The importance of due action of the skin is insisted on, with directions for improving baths, while sunlight is here formally elevated to the dignity of a remedy, and one of no mean importance. Without it

the preparations of iron will not correct anaemia; with it the capillary circulation is increased in vigor, elimination hastened, and assimilation promoted. A sun-bath is to be prescribed as part of the daily regimen of the patient.

But very little is said about medicines proper in this chapter. Iron occupies the chief rank. One class, however, the author believes to be neglected—"brisk purgatives from time to time, in the form of some mercurial." He duly considers the character of the patients, but still goes in for good old-fashioned doses of these medicines.

There is one point which receives especial consideration here, and upon which the author is very strong. It is the danger which all these patients run of lapsing into chronic invalidism and of becoming hopelessly bed-ridden. We think we read here between the lines a commentary upon a system of treatment which has very high authority in its favour, but which must be considered as yet passing through its trial stage before the profession. The fate of a patient who falls into this condition is a most lamentable one, and the physician who even passively acquiesces in it is reprehensible.

"There never was a greater fallacy in practice than to place in bed a woman suffering from uterine disease, with the expectation that she would recover her health by remaining there. . . . This is the history of becoming a confirmed invalid, due, in the beginning, entirely to the ignorance, to the indifference, or to the want of an honest purpose on the part of the attending physician."

A pathological recapitulation introduces the subject of local treatment, and this portion of the work presents more perhaps of novelty in doctrine and practice than any other, and will certainly be read with the deepest interest. Impaired nutrition, consequent loss of tone of the pelvic vessels, consequent increased weight of the organs, consequent increased secretion. Improvement of the general system effected by general measures, will improve this condition, but will not suffice for a cure. The tone of the vessels must be restored by directly exciting reflex action of the nerves which accompany them, thus causing their contraction. To effect this we have three agents—electricity, cold, and heat. The first is briefly dismissed as a "valuable adjuvant," and we hear but little, if any, more of it throughout the work. Cold is stated to be objectionable, because a congestion greater than that which existed before follows reaction from its application. It is in heat—in hot water—alone, that the author finds an efficient remedy. Upon this point he makes a revolution of doctrine, for the teaching of not many years ago was that injections were tonic and contractile in proportion to their coldness, and relaxant in proportion to their warmth. Thus taught Scanzoni, Bennett, West, and others. Not so the author. He holds that positive and permanent contraction is produced by hot water injections, given according to his plan, essential features of which are that the flow shall be of considerable duration, and the temperature of the water high—so high that it cannot be administered through a metal tube. To establish his views he enters into an extended and minute explanation, in regard to which we say that we are entirely willing to accept his statement of facts, while we demur to some of the explanations. The beneficial effects being proven by clinical experience, it matters little whether or not "any plan of treatment could be more rational or appeal more forcibly to the good judgment of every one." This measure of local treatment is claimed as entirely original by the author; he is "the first to use the agent in a systematic manner and to have done

so with a definite purpose, in keeping with what I considered to be sound pathology."

Its value is such as to justify a place at the head of the list of local remedies.

"The use of hot water vaginal injections is equally beneficial in all those conditions which constitute the various forms of disease in the female organs of generation, and which are amenable to any treatment other than a surgical procedure; and equally so, whether the congestion be arterial or venous. . . . So beneficial is its use, except in displacement of the uterus, that I believe more can be accomplished by this agent, and a carefully regulated plan of general treatment, than by all other means combined." P. 120.

"Since I have understood the action of hot water vaginal injections, I have realized that this remedy is destined to overturn both the theory and therapeutics of uterine disease, as now accepted." P. 258.

We know of no gynaecological authority which places so high a value as this upon a single remedy.

The next point in treatment is to see that the uterus occupies such a position that its circulation is unobstructed. The particular position of the uterus is to be judged separately for each individual; there is no common standard to which cases are to be made to correspond. Farther, "it is not so much the position which is to be corrected, as it is the obstruction to the circulation in the organ which is to be removed." In regard to fitting an instrument to effect this object, the practical point is insisted on that there is in every woman a normal health-line of position for the uterus, to which the organ is to be carried and maintained, but no farther; that keeping it above this line produces an equally deleterious influence in the way of obstructing the circulation, as allowing it to sag below it.

Thus far a good deal of ground has been gone over in regard to local treatment, and nothing has been said of medicines. Indeed, if the principles laid down are accepted, direct applications, of course, play but a very subordinate part. This is the direct consequence of the author's teachings, and the position is fully accepted by him.

"If the so-called ulceration of the cervix be accepted as a cause, and not an effect, the use of caustic applications is a consistent practice, and should be persevered in until the surface has been healed.

"But if it be held that the increased secretion is simply an attempt of nature to relieve an obstructed venous circulation, and that the erosion is a surface from which the epithelium has been washed away by the discharge constantly flowing over it, then such a course of treatment is to be deemed not only irrational, but most hurtful.

"A whole generation of physicians has been misled by the delusion of *chronic inflammation and ulceration* of the uterus, conditions which no one has yet been able to demonstrate on the dead body."

Nevertheless, medicines for local application are advised. Nitrate of silver occasionally, impure carbolic acid frequently, iodine oftener, and these, with tannin and glycerin, nearly complete the list. It is held to be an essential character of applications that they be "innocuous to healthy tissue, as we cannot limit their action to the diseased surface exclusively." The author admits that "when the surface of the uterine canal has become covered with granulations or vegetations, the actual cautery and the strongest mineral acids may often be applied with impunity," yet he thinks the practice unnecessary, and to be avoided.

One so conservative as the author would not, of course, occupy different ground from gynaecologists in general as to intra-uterine injections. In

the undilated organ they are dangerous with whatever instrument given, or with whatever precautions administered. He rejects, however, the generally received explanation of their evil effects, as being produced by passage of the fluid through the Fallopian tubes into the peritoneal cavity, but would rather explain them by some effect on the nerve centres, which we do not understand. Dilatation of the uterus, however, is of itself a curative influence, and prepares the way for hot water injections, which exercise a more decided action on the interior of the uterus than any other remedy. A large part of the eighth chapter is taken up with the directions for carrying out these measures of treatment.

In many quarters we believe the impression has prevailed that this work would be ultra-surgical in character, the impression having had its origin perhaps in the fact that most of the author's contributions to the journals have been upon operative subjects, perhaps in the well-known fact of his skill as an operator. Any impression of this kind will be removed by the perusal of this chapter, and whatever may be the judgment of the reader as to the author's predilection for operating in any certain line of cases, there cannot remain the slightest doubt as to his position upon operative interference in general, from the following strong and pointed remarks :—

"The female organs of generation have been mercifully endowed with a degree of tolerance to injury not possessed by the male. . . . But few, however, of the many physicians who undertake to heal these diseases fully realize that there is naturally a limit to this immunity. No portion of the body has suffered more in consequence of incapacity on the part of members of the profession, many of whom, from ignorance, have been unable to appreciate in detail the true bearing of all pertinent points. . . . Under the guise of surgery the uterus has been subjected to a degree of malpractice which would not have been tolerated in any other organ of the body. Its cavity has been, and is still made, the receptacle for agents so destructive, that no conscientious man would employ them for the treatment of disease in any other cavity of the body without a full appreciation of his responsibility. But I trust that we have already passed the heroic age, and that in the treatment of these diseases we may be governed hereafter by the same rational principles as would be applicable elsewhere; that we may simply, as we term it in this country, exercise our 'common sense.'"

We have devoted a very considerable amount of space to a consideration of that portion of the work devoted to principles, because principles form the foundation upon which the superstructure is erected, because there is much in this part novel as well as interesting. A few portions must now be selected from the more practical part for examination and comment. We begin with the chapter devoted to cellulitis because of the high rank in importance given to this disease by the author, and because in it he repeats and amplifies some of his peculiar views. It is a disease, we are told, very frequently overlooked by practitioners when circumscribed, or not appreciated, if discovered. Yet it is at once the most common and the most important of diseases of women.

"A great advance will be made in the diseases of women whenever practitioners become so impressed with the significance of cellulitis as to apprehend its existence in every case. The successful operator in this branch of surgery will be he who is always on the lookout for the existence of cellulitis, or who is taking measures to guard against its occurrence."

The existence of cellulitis is the first point to determine in making an examination; if any point of thickening or tenderness is found, the prudent practitioner will abstain from any further manipulations. The sound is not to be used; a displaced organ is not to be restored to place; no application is to be made to the uterine canal.

The full importance of the disease can only be understood, however, when it is looked upon as the "key to many of the pathological changes now treated as uterine disease."

"We must look to pathological changes in the connective tissue as the cause of the results we now regard as the original disease in the uterus and ovaries."

That this is revolutionary doctrine is fully recognized, for it is again said elsewhere that upon this point we have hitherto "confounded cause and effect." It is also further said that an affection of a *portion* of the cellular tissue may produce congestive hypertrophy of the uterus.

We find the reasoning presented which has led to this conclusion:—

"Experience teaches that hot water is indispensable in the treatment of all uterine disease, and, since it only affects the supposed disease indirectly after giving tone to the bloodvessels in the connective tissue of the pelvis, we may fairly raise the question as to the original seat of the disease."

There will be found those, we believe, who will not admit the premises, and more who, having accepted them, will not admit the conclusion.

The statistics of this chapter are made up of tabulated analyses of 303 observed cases, with all their possible complications. As to the different divisions of pelvic inflammation, as cellular and peritoneal, the author does not admit them, but rejects the terms para- and perimetritis, and says the distinction cannot be made at the bedside. As to the causes, he finds a large percentage of cases due to criminal abortion and other violation of natural laws, and attributes great influence to the use of the sewing machine, although the tables do not sustain him in the latter.

The treatment of so important and frequent a disease receives, of course, due consideration. The main idea is to produce contraction of the vessels, and thus relieve pelvic congestion, by hot water injections long continued. Other measures and remedies are duly considered, and the treatment of pelvic inflammation, in its different aspects, detailed at length. The chapter closes with a quotation of Dr. Brickell's views as to evacuation of the effused serum early in the disease, a proceeding which the author does not counsel, because he considers it dangerous.

One of the most important portions of the work is that devoted to the consideration of lacerations of the cervix. These lacerations, a very common consequence of labor, have been long enough known and understood. Their importance, in a gynaecological sense, was first recognized by Dr. Emmet in 1862, and since that time this lesion has been the subject of several communications to the profession. Two chapters are here devoted to it, and it occupies the same relative rank among the accidental, that cellulitis does among the natural causes of female diseases. Indeed it would be difficult to exaggerate the importance which is attached to it throughout the work. "At least one-half of the ailments among those who have borne children are to be attributed to lacerations of the cervix." It is stated to be the most common cause of irregularity of menstruation both in regard to time and quantity; in most cases it is the cause of hypertrophy or sub-involution of the uterus after delivery; for many years the author has met with few or no cases of sub-involution not due to it. Finally, he does not hesitate to express the opinion, and that more than once, that laceration of the cervix has a very close connection with the origin of phthisis, and that malignant disease frequently springs from the seat of this injury.

Although this subject was formally presented to the notice of the profes-

sion in 1874, yet, singularly enough, it has attracted but little attention, and been the subject of but few communications. Abroad, it is in Germany alone that the importance of the injury and its influence in causing disease has been recognized. Several papers have been published in that country by men eminent in the profession. In England, the last edition of the leading work on gynaecology, bearing the date of 1878, barely mentions it. Indeed the author had better have omitted any reference to it at all since if it is of one tithe the importance which Dr. Emmet attaches to it, it deserves more than the mere statement of its existence, and a scant half page devoted to it. From what has been published abroad, however, and from papers which have appeared in this country, it is only just to say that they sustain the author in the main, certainly so as to the consequences of the more pronounced forms of the laceration. Thus, to attribute the origin of malignant disease to a simple scar, or a lip of the laceration may seem exaggeration, and at variance with generally accepted pathological doctrines, yet in this view Breisky and Veit seem to concur,¹ the latter having found three cases out of nine of malignant disease originating in this way. Although this is far from establishing the causal connection of the two, yet it will not do to despise even a suspicion which practical men gather from experience.

In regard to the frequency with which laceration of the cervix plays an important part in causing disease or demands direct treatment, there is a wide difference between the author and other observers. Thus, his statistics of the last five hundred women coming under his care, give a percentage of 32.8 per cent.; while Mundé² gives about 6 per cent. Dr. Goodell,³ about one out of every six, Hanks,⁴ a little over one-eighth, and Dr. Barker,⁵ says, speaking at a time at least four years after his attention had been especially called to the subject, that he had only succeeded in finding two cases.

Various reasons have been given for this discrepancy. Different classes of patients furnish different results. Different treatment during labour and circumstances compelling exertion or permitting due rest afterwards undoubtedly play a chief part. In regard to the first there is an important obstetrical lesson. We have long been convinced that the late improved (we write "improved" advisedly) teachings in regard to an early and frequent resort to the forceps have been carried too far, not by those who teach them but, as is always the case, by rash and injudicious men, carrying the teaching beyond reason. This suspicion is confirmed by the author who says that there are some physicians who to save time are in the habit of delivering with the forceps, without the slightest reference to the stage of labour, and that—

"There can be no doubt of the fact that among the poor, in this city at least, the forceps are employed to a greater extent than would be permitted among the wealthier classes."

The doctrine of the author as thus far stated is but a small portion of the subject. Not only is laceration of the cervix unrecognized, but it is, or has been universally mistaken, when seen, for something else. En-

¹ Indications for Hystero-Traehelorrhaphy. By Paul F. Mundé, Amer. Journ. Obstet. Jan. 1879.

² Loe, cit.

³ Address on Obstetrics to Medical Society of Penna., May, 1878.

⁴ American Journal of Obstetrics, November, 1874, p. 456.

⁵ Medical Record, March 9, 1876.

larged and elongated cervix, ulcerations or excoriations of the os, granular and cystic degenerations, these are really lacerations of the cervix. Profuse leucorrhœa, discomfort upon standing, backache and pains in the limbs, irritation of the bladder, and marked nervous disturbances are the symptoms which make known the injury: these being present, an examination will reveal a laceration. Apparently there may be a granular erosion, or what is commonly termed ulceration, but on close examination it will be found to be laceration, the close examination consisting in drawing together the lips by tenacula, when a surprising diminution of bulk will be effected, and the true state of the case be revealed. The lack of recognition of this fact, and the lack of the special examination, explain why the lesion has been overlooked; the author confesses that for these reasons he himself formerly made the mistake and this is why "the profession to-day all over the world are cutting off and burning parts of the cervix which, if otherwise properly treated, would result in restoring the uterus to its normal condition."

In regard to the great value of the contribution to medical science which Dr. Emmet has made in recognizing this lesion and its pathological influence there can be no question. It is one of the most notable advances of gynaecology made in recent times, and has been so recognized by those most competent to judge. When the first paper was read upon the subject before the Medical Society of the County of New York, the operation for the relief of this injury as devised and executed by Dr. Emmet was spoken of in the highest terms, even as "perfect," by Dr. Sims, and upon his motion the thanks of the Society were tendered to the author for the contribution.

The value of the discovery is also attested by gentlemen of high position and large experience to whose papers we have already referred. These remarks apply to the well-marked cases of laceration. When it comes to the minor forms, to the cases in which, upon the author's own showing, it is exceedingly difficult to demonstrate a sulus, or a division of the tissues, to cases such as those described on page 469 in which repair has taken place, and the operation is for the removal of a "cicatricial plug," there will be, we think, difference of opinion and dissent. The medical gynaecologists will hesitate to give in their adhesion to a doctrine which is ultra-surgical until it is most thoroughly proven to be true, men not as skilled in operating as the author, and all those who cannot command skilled assistants, will use all other measures before resorting to an operation which requires considerable skill to execute. Indeed the position of the author in regard to the etiological connection between laceration and subinvolution has already been challenged by very high and competent authority, and the ground taken that both are more probably the common result of some as yet unknown cause.¹ This part of the subject then, that is, the influence and importance of, and the necessity of operative interference for, the minor forms of laceration of the cervix, must remain open for decision, subject to the results of farther experience and the testimony of other observers.

The treatment of this injury follows in due course. First the preparatory, and this is to be continued many weeks, perhaps months, and is not different in general character from that generally resorted to by the profession in those (so-called) inflammatory affections and chronic conditions from which it seems so difficult to distinguish laceration. This fact is of prime importance, and must be ever borne in mind in forming a judgment

¹ Remarks at N. Y. State Med. Soc. 1878, by Dr. Fordyce Barker.

as to the author's doctrines, and as to the operation for this accident. In regard to the operation itself, it is minutely detailed, indeed "perfect." In reflecting upon the frequency with which the author resorts to it, and the high estimate he places upon it, the history of incision of the cervix for stenosis, dysmenorrhœa, and sterility, will force itself upon the mind, with the suggestion of "history repeating itself," a repetition of as wide a departure by the profession in this instance, as followed in regard to the favourite operation of the gifted Simpson.

The operation for laceration is closely allied to another—amputation of the cervix—and the subjects follow closely, indeed run one into the other. In the chapter devoted to this operation we find a still wider departure from the teaching of other gynaecologists and from generally accepted pathological doctrines. Thus the author lays down the law that there is but one condition of the cervix for which amputation is justifiable, and that is malignant disease. That as a remedy for laceration, for hypertrophy, or for elongation it is to be utterly and entirely rejected. As he is thoroughly in earnest there is no mistaking his positions; as he admits that he formerly operated for these conditions, and has discovered his error and changed his practice, there can be no question as to his honesty. The peculiarity of his position and of his teachings, however, do not end with what we have above stated; it extends even to a flat denial of the existence of hypertrophy of the cervix and of the elongated cervix.

"The commonest error of the day is a mistake in diagnosis between a laceration of the cervix and its supposed enlargement or elongation."

And these conditions, or what has been described as such, are simply cases of laceration which have been misunderstood, just as erosion or ulceration has been misunderstood! What would Cruveilhier and Huguier say to this? and what are we to do with the illustrations, "*ad naturam*," of our text-books, even after we have disposed of the doctrines of all our standard gynaecologists? The long and pointed cervix which has been so fully recognized as a cause of sterility comes likewise under the ban: "I will no doubt be reminded of certain cases of supposed elongation of the cervix found in unmarried women, but I deny that such a lesion exists," p. 479; which is somewhat qualified on p. 482 by the statement—"I am almost prepared to deny that such a condition as elongation of the whole cervix ever exists; it certainly is never found in a woman who has ever been impregnated."

Where opinions differ so widely, one side or the other must be wrong, and if wrong the mistake cannot be either trifling or harmless. This position is fully accepted by the author:—

"I advance the statement, without qualification, that this operation [amputation of the cervix], as at present applied, is to a greater extent a malpractice, and is attended by more evil consequences than any other procedure now resorted to in this branch of surgery."

He is never particularly mild on the profession, and here is especially severe, including, of course, other gynaecologists:—

"It is equally true to-day that the profession all over the world are cutting off and burning off parts of the cervix, which, if otherwise properly treated, would result in restoring the uterus to its normal condition."

Of course such statements are beyond criticism. When an author absolutely denies the existence of a thing, such as an elongated cervix in a nulliparous woman, he so flatly contradicts what we believe we have

learned by actual observation that we do not know what to think. This, however, we may justly say: when a writer is so particularly emphatic upon a point, he should begin by carefully defining his terms and giving his measurements. Thus, as we nowhere find stated at what length a cervix should be considered to be an elongated cervix, it is possible that the author, and those who differ from him, may be thinking of two conditions not widely different, and might agree perfectly as to the terms to be applied to cases under actual observation. For there is a distinct recognition in the book of elongated necks! thus, on p. 353, we read of cases in which the "neck is unusually long," and on p. 354 of an operation being necessary "whenever the cervix is of unusual length," and on p. 361 that "a long cervix is sometimes the cause of retroversion," and there are many other instances.

Evidently these views of the author have met with opposition, and this has, perhaps, led to an exaggerated statement of them; undoubtedly some such influence has been at work, or he would not have been betrayed into such unfortunate paragraphs as the following:—

"I have not deceived myself, nor do I exaggerate these statements in the slightest degree. Yet their truthfulness will be questioned, I have no doubt, by two classes, equally conscientious in their position, viz., those who are too indolent to thoroughly investigate the merits of the case, and those who remain in ignorance from having already reached an age (varying with all of us) at which we cease to appreciate new ideas."

This will hardly ever do in anything—it will never do in science. Denunciation of those who do not accept new doctrines never aided their spread. We could add to the above a large class, not too indolent to investigate, as earnest and as honest as the author, always willing and even glad to receive all new doctrine when it is proven to be good. They will hesitate to accept the views here presented until the verdict of further time and other observers, already alluded to, has been rendered. That having been given in their favour they will most cheerfully accept the operation and not be backward in practising it.

These points and these peculiarities render this chapter, in our opinion, the most unsatisfactory of the work. As there is one part to which we do not know what to say, there is another which we do not understand. We allude to the description of the behaviour of certain uteri as given on pp. 482-3. We cannot gainsay the facts observed by a competent observer; we are acquainted with delineations of lengthened uteri in standard authors; we are not prepared to deny that such uteri draw out and contract like a telescope; but when they do so, we cannot understand why the lengthening should occur when the woman stands up, and the shortening when she is placed in the knee-elbow position—in both instances the movement being directly against the force of gravity.

In noticing the practical part of the work, we have chosen those portions which presented the most salient points of attraction, which have shown the widest departure from accepted views, or illustrated the author's peculiarities of doctrine or practice. Much of the best part of the work must be left unnoticed, or simply referred to our readers as worthy of their closest attention. The chapter on ovulation and menstruation is one of the best physiological chapters of the work, and is the most important and valuable contribution to the study of these important subjects of recent times. Uterine flexions and versions are studied at such length that their consideration would lead us too far. Procidentia and pessaries receive

the attention they deserve. In regard to the latter, the author holds so exclusively to original ones formed from block-tin rings, that we think that the omission of some hints for guidance as to choosing among the legion before the profession will be felt as a lack which might have been easily supplied. We may further say of the pessary figured on p. 373, and after which fancy has no further forms to furnish, that if it so often fails, from being made of too large-sized wire, then the exact size of wire required should have been given.

The treatment of fibrous growths of the uterus is especially full and indispensable to every operator, and the same may be said of the chapter on cystitis and the operation for its remedy, a subject with which the author's name is indissolubly connected. To vesico-vaginal and rectal fistula nearly one hundred pages are devoted, in a manner which might be expected from the well-known monograph by the author, already before the profession, and we only allude to the subject to call attention to the deep debt of gratitude due to Dr. Emmet for his labours in this direction. The position of the consulting and operating obstetrician is often most embarrassing. Called in at a late hour to neglected labour cases, he finds instrumental assistance imperatively required, and renders it. If, then, a fistula follows, it is charged by the friends of the patient to his active interference rather than to the neglect and delay where it properly belongs. The author was the first in this country to direct attention to the true relation of cause and effect whereby many a member of the profession has been relieved of unjust blame. We say "in this country," because the opinion was expressed as long ago as by the elder Osiander, and even before him by Dubois, but their testimony seems to have passed out of the memory of the profession.¹ Dr. Emmet is the first anywhere to furnish indubitable statistical proof in regard to the matter.

We regret to notice a good many errors in words scattered through the book. The most of them are of little consequence, but this cannot be said of the use of "aconite" for "digitalis" on p. 281. We looked for and hoped to find a correction of this in the list of errata, but do not. We assume it to be an error, although twice repeated, because not only do we know of no authority for such a use of aconite, but, according to all teaching, aconite is a dangerous remedy in such conditions.

We commend this book to the profession, with the assurance that it is well worthy of their most careful consideration. It contains much that is new, some things that are not yet accepted, and some that will give rise to controversy and perhaps excite opposition. Although it has some weak points—and what book has not?—yet it contains a vast amount of most valuable matter—of matter that is positively good and eminently practical. For several reasons which we could mention, we do not believe it to be the best book for elementary study, but for the practitioner it is admirable, and no one giving any attention to gynaecology can afford to be ignorant of its doctrines or of its practice. It is a book to be studied rather than read, but it can neither be read without interest nor studied without profit. We believe the profession will receive it in the spirit in which the author proffers it in his preface, as the lifetime work of an earnest, honest, devoted, and conscientious man.

J. C. R.

¹ Handbuch der Entbindungs-Kunst, iii. pp. 143, 144. 1825.

ART. XIX.—*Iconographie Photographique de la Salpêtrière (service de M. Charcot).* Par BOURNEVILLE et P. REGNARD. Part 2me. 4to. pp. 234. Plates. No. xxxix. Paris : V. Adrien Delahaye & Co., 1878.

M. BOURNEVILLE is known to American readers as the intelligent and industrious assistant of M. Charcot. It is he who has systematized and edited his famous teacher's work; but while doing this he has himself added greatly to the value of the material which has passed through his hands, and his own researches in hystero-epilepsy, sclerosis, etc., are scarcely less valuable than those of M. Charcot; consequently in the volume before us we naturally expect to find a great deal that is new and good, and we are not disappointed.

Bourneville and Regnard have been engaged during the past two years in photographing the patients at La Salpêtrière, and their results form the basis of the work. There are in all thirty-nine plates, prepared by a new process of photo-lithography, a photographic impression being first made upon the stone in a dark chamber, and this stone is used with a fatty ink, as in the ordinary lithographic process. The plates are consequently very faithful copies from originals, but as it is next to impossible to obtain a sharp picture of such patients as those figured, because of their constant agitation, it has been found necessary to retouch to a great extent. This procedure, however, takes little from the value and accuracy of the picture.

The plates illustrate two forms of nervous trouble, the first of which is *partial epilepsy*, the second *hystero-epilepsy*, and besides these illustrations of a lithographic character, there are several wood-cuts distributed through the text.

The first half of the volume is devoted to the consideration of partial epilepsy, which is a term used by the author in the same sense that it is by Hughlings-Jackson, to indicate a local cortical discharge. Most of the cases brought forward by Bourneville are those which we have been taught to consider under a variety of names, such as atrophy of the brain, post-hemiplegic chorea, athetosis, etc. etc., with the addition of the epileptic element.

Bourneville divides partial epilepsy into three varieties:—

1. Partial hemiplegic epilepsy—that form in which the paralysis and other troubles begin early in life. The phenomena of the attack resemble those of common epilepsy, with this difference, that the convulsions are limited to the paralyzed side.

2. Partial tonic epilepsy with contractures.

3. Partial "vibratory" epilepsy.

In illustration of the first form, two cases are given. The first presented cerebral atrophy with right hemiplegia (patient supposed to have been born with the paralysis), epilepsy appearing at 12; the paroxysm always preceded by aura beginning in paralyzed side, after which the hand and arm of this side become agitated by convulsions. The patient next becomes unconscious; vertigo at times. The second patient presented this history: convulsions at 17 months; left hemiplegia; appearance of epilepsy at the 12th year as the result of fright; aggravation of the attacks at 22; gastric crises; migraine; disturbances of sensibility, etc.

In both of the subjects the convulsions which began in the paralyzed side were characterized by three stages, a tetanic, a clonic, and a ster-

torous, and there was an elevation of temperature. The convulsions varied in duration from ten to fifteen minutes.

This class of cases includes those of a kind dependent upon an inflammatory cerebral lesion. There may be a disappearance to some extent of the initial paralysis, but there remains afterwards a feebleness and uncertainty of movement, until at the end of a year or so when there is the accession of epileptic symptoms limited to the weak side only; after them remains a species of secondary lasting hemiplegia. This is the abstract of an illustrative case:—

"At the age of twenty-five months Per— was attacked with convulsions, which lasted nine hours, confined to the right side of the body, and involving leg, arm, and mouth. On recovery, she was found paralyzed, and could not move at all the arm or leg of the paralyzed side (the right). Three months afterwards she was found to have regained some of her lost power, but her limbs were rigid, and a marked stiffness was observable at the end of the fourth month. At four years and a half she became again attacked with convulsions, which lasted for four or five hours, the movements being confined to the right side; complete flaccidity, followed after a time by a return of the rigidity. When five years of age there was a third illness, lasting twelve hours, in which the convulsions again appeared on the right side, with fresh paralysis and rigidity. The hemiplegia is complicated with athetosis."

Certain features of the disease are prominently mentioned. We are told that the upper extremity is the seat of more profound and obstinate contracture than the lower, and so with the convulsions, which nearly always begin in the superior extremities. Joint pains and arthropathies almost always follow the paralysis. The shoulder and elbow are the seat of lively pains, which are increased with sudden variations of temperature. The atrophy both of muscles and bones is decided on the paralyzed side. The muscles ordinarily retain their electric contractility.

In the third group of this first class of cases these paralytic and epileptic manifestations are connected with certain varieties of movement more familiarly known as hemi-chorea and athetosis. The latter Bourneville believes to be a symptom only, and not a disease having peculiar and distinctive characters. This localized disturbance of motility occurs, as Bourneville thinks, in many cases of cerebral atrophy, and this is probably the opinion of most neurologists who have had much experience with chronic nervous cases at hospitals. Indeed, the "athetoid" symptom is by no means as rare as certain authors would have us believe. There is a hyper-extension of the fingers in many of these cases at one part of the local "athetoid" movement, and this, with a certain vermicular slowness of extension and flexion, is its only peculiarity. The objections of Charcot to Hammond's term are presented, which go to prove what all neurologists have appreciated, viz., that "*athetosis*" is a misnomer; for the movements described by Hammond are not confined to the hands and fingers, but are to be witnessed in other parts of the body, the foot, arm, face, and neck muscles being agitated in certain cases. In the majority of Bourneville's cases the appearance of the so-called athetoid movement was from fifteen to twenty days after the convulsive attack.

Upon page 40 the differential diagnosis between these various movements is clearly drawn, but there is little presented that is new. The mental peculiarities of some of these patients are noted and illustrated. Plates V. and VI. represent an imbecile, with right hemiplegia and contracture; Plate VI. *bis* represents arthropathic changes in the right upper extremity.

It was found by Bourneville that the epileptic cry is usually absent; that the clonic convulsions are nearly always limited to the paralyzed side; that they are more violent and less prolonged when they affect the sound side of the body. Frothing at the mouth is rare, and involuntary micturition still more so; the period of stertor is short, and this condition not at all profound, while the patients regain consciousness without the delirium which is found in ordinary cases. Trembling usually succeeds the attack, and is an interesting symptom. The disease in many of the cases lasted ten, fifteen, or twenty years, and occurred as often sometimes as eight or ten times a day. The attacks were both diurnal and nocturnal.

The second grand division, viz., partial epilepsy of a tonic character with contracture is illustrated by two cases. The points of the attack in one case are briefly as follows:—

An *aura* consisting of vertical pain in the head, confined to the left side, and accompanied by throbbing; epigastric pain and violent palpitation preceded the convulsive symptoms. The last three fingers of the right hand became cold, and the seat of trembling. The face became pale, and bore an anxious expression. She sought a chair, appearing dazed, and complained of flashes of light shooting before the eyes; the eyes were spasmically closed. The attack began by contraction of the muscle of the right side of the neck, which drew the head to the corresponding shoulder. The eyelids were closed and agitated by slight movements. The pupils were dilated. She did not lose consciousness, and the face was constantly turned to the affected side of the body. The right arm was contracted in extension and pronation, the hand being bent at a right angle with the arm. The index finger and second finger were extended, while the others were semi-flexed. The right inferior extremity is often contracted in extension, but less intense than in the arm. These different symptoms, which constitute a species of primary phase, last a minute; then the patient turns in her chair from left to right, the head remaining always inclined towards the right shoulder, but the chin is directed towards the sternum. At this moment the anterior part of the body is drawn towards the back of the chair, the forearm is flexed at a right angle on the arm, and is drawn across the dorso-lumbar region. At the end of two or three minutes the patient rotates in a contrary direction—from the right to the left—that is to say, the original position. The eyes open, the forearm is extended violently, all the other symptoms disappear, and she asks for a drink of water, the teeth clattering on the edge of the glass. These attacks last for two or three minutes—sometimes for five or eight minutes, and there is a rapid return to the normal condition.

The third variety, the vibratory partial epilepsy (*l'Epilepsie partielle vibratoire*) is quite rare. The features of the disease are illustrated in the case of Marl. At four and a half years of age she had an attack of convulsions announced by crying, grimaces, etc., and after these prodromal symptoms she became convulsed and remained so for thirteen hours. During this time the movements were confined to the *right side of the face and body*. The discharge of urine and feces was voluntary. After these convulsions she went out to play as if nothing had been the matter. About a year later M. had convulsions lasting an hour, which again affected the right side, leaving after them a certain degree of paralysis which caused the child to drag the right leg. The paralysis of the right leg was not

aggravated during the first year and a half to the sixth year and a half, and the right upper extremity was free. Her intelligence was unaffected, and developed naturally, and she was sweet tempered and affectionate. Six months after this she became irritable, and the right leg became the seat of jactitations for thirty seconds at a time. There was no loss of consciousness, no cry, no frothing at the mouth. Later on these attacks became more frequent, and were preceded by irritability. They subsequently grew stronger and next the right arm became the seat of "vibrations," and finally the left side of the body became involved. At this time there was loss of consciousness, which lasted from one to two minutes. These attacks were nocturnal and diurnal, but predominated during the day. Two cases of this kind are given, and in the second case two or three plates are presented which illustrate the phases of the attack.

These then are the three forms of partial epilepsy, though strictly speaking the second form is not an epilepsy at all, for there is no loss of consciousness. In the others the relation of the convulsive attacks to the primary nervous condition is sufficiently near to bring it into the case as a part of the pathological process. Heretofore such cases were spoken of as "Hemiplegia with epilepsy" or "Hemiplegia followed by athetosis," and very little importance was attached to the convulsive character of the post-paralytic state. Now an entirely new interest is given to the disease picture, much of which arises from the connection of such phases of exaggeration or disordered motility with lesions of the cortical centres. Thanks to Hughlings-Jackson, these patients, who before were the least interesting of all chronic hospital cases, become subjects of the most attractive kind of study.

The second and most important part of M. Bourneville's work is that which considers hystero-epilepsy. Charcot and Bourneville were, without doubt, the first persons after Briquet to study and describe this most dramatic and curious disorder, and have succeeded in attracting general and unusual attention to the little group of patients of this kind gathered at La Salpêtrière. Before the early *leçons* of Charcot, these particular phases of hysteroid disorder were not recognized as distinct, and all such cases were roughly grouped under the head of "hysterical convulsion." A few years later Bourneville described more carefully and fully the cases of "Ler," "Etchv," and others of Charcot's patients, and within the past year or two they have been seen and examined by Ernest Hart, Sigerson, Dumontpallier, Luys, Westphal, and others, who have described the attacks, and metallo-therapy, and have attested to the wonderful character of the disease.

These descriptions are too familiar to need repetition, and in a review of this kind any extended criticism of the subject would be out of place, for M. Bourneville's book is but an admirable recital of the clinical feature of hystero-epilepsy, and he does not enter into the consideration of its pathology. It may not be amiss, however, to briefly call attention to the peculiarities of the disease, which, as we know, is a peculiar combination of epilepsy and hysteria, the convulsive element predominating at times, and the psychical at others, and as a result of this mixture we find a series of attacks beginning with tonic and clonic convulsions, stertor, and delirium, and separated by periods of repose which have varying duration. These attacks occur as repeated paroxysms, sometimes numbering several hundred, and are produced by exciting causes such as sudden emotional disturbance, visual stimulation by bright light, the patient being made to look fixedly at a calcium or electric light, or by pressure upon some parts of

the body, such as the spine, or the mammae which are especially sensitive, and so much so as to have given rise to the mistaken diagnosis of cancer in times gone by. In the two cases which form the chief part of the volume before us, and if our memory serves us aright, in nearly all of M. Charcot's previous cases, there has been a groundwork of the most dramatic description. This is especially the case in the first patient presented by Bourneville, in whom a history of early neglect, orphanage, seduction at fifteen by a man of seventy, who drugged her, etc. etc., make up a truly sensational story. Other women have been prostitutes, and others were apparently insane. In these as well as in other cases there is a suspicious element of fraud upon the part of the patients indicative of an inclination to deceive, which may be and is purely involuntary. This has its counterpart in men and women all of us know, who lie as naturally as they eat or drink, and have no conception of their unfortunate failing, while they very rarely have anything to gain by falsehood. In the hystero-epileptic patient, and in fact in the aggravated hysterical patient, misrepresentation and untruthfulness become secondary moral habits. This we have seen in a young woman who expressed every desire which seemed earnest to eat, but would not swallow, or retain any article of food she took herself, though she cried for hours because of her demoralization and weakness, but retained what was forced into her stomach and obeyed the directions of any person of stronger will. Consanguineous marriages are not considered by Dr. Bourneville to have much to do with the development of this state, but sexual vices, menstrual disorders, and various nervous diseases of the parents are held by him to enter into its proximate or remote production. In this connection it may be well to allude to Bourneville's statement that he has observed that nightmare and bad dreams in childhood have played an important part in the etiology of the affection.

The prodromal features of an hystero-epileptic attack are ovarian hyperesthesia, the globus hystericus, cardiac palpitations, constriction about the neck, noises in the ears, violent beating of the temporal arteries, obscure vision, etc. The immediate attack is ushered in by irregular respiration, oppression and dyspnoea, awkwardness of speech, amounting to embarrassment, of which the following example, which occurred in one of our author's cases, may be presented. After the prodromal symptoms described above, the patient, with hesitation and difficulty, enunciated the words : "J'ai . . . l'a . . . respiration . . . dif . . . facile . . . se . . ne . . . serai . . . pas . . . malade . . . afin . . . de . . . pas . . . avoir . . . de nitrite d'ainyle," in the way they are written. Some tumultuous heaving of the belly then follows, the eyelids palpitate rapidly, the look becomes fixed, the pupils dilated, the gaze is fixed upon some object above, and then she loses consciousness.

The actual attack is characterized by an initial stage (*the tonic phase*) of tonic convulsion. The entire body becomes rigid, the arms being usually stretched out, and the hands turned in ; there is a movement of circumduction of the hands and forearms, the arms being drawn across the body, and the back of the hands brought together, so that the knuckles are approximated (see Fig. 1). The inferior extremities are stretched out, and drawn apart, the feet being in the position of equinus varus, but in other cases the feet may overlap each other, the toes being strongly flexed. The face is contorted and suffused with blood, and the mouth is often widely opened, or in some cases tightly shut, the lips being compressed over the teeth. Res-

piration is suspended, the pulse is with difficulty perceived, and the belly is immobile and contracted. The next phase is that characterized by *tetaniform* and *clonic spasms*, the head, which was drawn downwards and to one side or backwards, returns to its normal position, the facial muscles become seized with clonic spasms, and the eyelids are opened and shut violently but somewhat slowly. A *stertorous phase* supervenes, the face

Fig. 1.



becomes covered with large drops of sweat, the respiration grows noisy and violent, and there is frothing at the mouth. A period of repose then follows, when the respiration appears regular; there are movements of swallowing, abdominal gurglings are heard, and undulations of the abdominal walls become apparent. The *clonic phase*, which has been described as the "stage of contortion," is expressed in two ways, which sometimes succeed each other in the same attack. 1. In clonic movements of the limbs and head, which is rolled from side to side. The face is red and engorged with blood, the neck is stiff, and the arms are stretched out and contracted, and after a time the patient falls violently to the bed, arising and falling again several different times. At the same time the rigidity of the arms disappears, little by little.

2. "The mouth is widely opened, the tongue is protruded; she moves rapidly to the side of the bed crying oh! oh! (*oue! oue!*) The body becomes curved in opisthotonus (see Fig. 2). She rests on the back of the head and feet, the hair is dishevelled, the legs are convulsed and agitated by alternate movements of flexion and extension."

A new period of repose follows.

By far the most interesting phase of the disorder now makes its appearance, viz., *the period of delirium*, and much of the attractiveness and interest of the volume before us depends upon the great number of beautiful plates which depict the various changing expressions in the emotional gamut. Artistically they are of value, for in no other way is it possible to obtain such vigorous, rugged portrayals of natural emotion so necessarily devoid of artificiality. Psychologically they are interesting as involuntary exhibitions of unbridled emotional excitement, just enough intellect remaining to serve as a basis for the activity of the ideational centres. In Dr. Bourneville's patients, and in fact those of other observers, the incidents of the previous life figure conspicuously in the delirium, and though there is a tendency to the formation of causeless hallucination of

the horrible kind, in which reptiles, and such small animals as rats and cats figure at some stage, there is an old impression which serves as a field for the development of a delirium which is exhibited by gesticulations and facial expressions of fear, ecstasy, anger, mockery, erotism, and grief.

Fig. 2.



The patient at this stage assumes an attitude and expression indicative of her emotional condition. She may remain lying upon the bed, her body inclined to one side, her arms resting by her side, her face upturned and wearing a beseeching look, which constitutes the "Attitude Passionnelle" of *Appeal*. At another time she clasps her hands, sits up, turns her face upwards, and gives expression to words of supplication, such as these; "Tu ne veux plus? Encore . . ." this being the "Supplication Amoureuse." At other times the patient lies upon her back, her arms crossed over her breast, and her face wreathed with a most sensuous smile (*erotisme*). Again, the attitude *Menace* is represented in four plates, showing a rather pretty young woman in the half erect posture, with clenched fist and clouded brow, giving utterance to such words as "Vilaine bête!" or "Sale bête! Pignouf! . . . Est-il permis?" while she strives to catch the unpleasant figure which torments her. "Infâme! Lâche!" and she launches forth into a string of hearty invective. It would indeed be a protracted and difficult task to enter into the extended discussion of these various interesting and peculiar expressions of delirium, and the reader must consult the work itself if desiring an exceedingly amusing and curious study.

The variations of the delirium do not seem to be at all regular in their mode of appearance or constancy, but there is a general similarity in the form of emotional excitement and method of expression, and from an inspection of either of the cases, it would appear that for several days at a time there were convulsive attacks followed by delirium, in which scorn, mockery, fear, amorous ecstasy, subsequent repose, and either a return of the delirium, or fresh convulsions, occurred.

There may be fifteen or twenty attacks in twenty-four hours, or even many more, and some of these are aborted or irregular, at such times the only manifestations being those of a purely psychical nature; the syncopeal attacks being examples of this kind. In rare cases the *clonic phase* (or period of the grand movements) is followed directly by the extension of the arms at right angles from the body, so that an appearance is presented which has been called *Crucifiement*, or the position of crucifixion.

This is usually associated with the portrayal of various ecstatic states, which are termed by Bourneville *béatitude*, etc. The first of these is most strikingly portrayed in the plate which is here reproduced (Fig. 3).

Fig. 3.



A feature of Observation 1, is the complication of chorea, which was manifested at different times in the course of the disease. It was of a rhythmie character, and involved the entire body, so that the trunk was drawn backwards and forwards, the forearms were flexed and extended, the hands were pronated and supinated alternately, and the legs and thighs flexed and extended, the right eyelid became closed, and the muscles of the right side of the neck were convulsed. This occurred in paroxysms, and was modified under ovarian pressure, the movements becoming less violent, and finally ceasing. When the compression was suspended, the movements began anew, and a violent contraction of the right arm and leg, which had lasted during the maintenance of pressure, disappeared. Ether was given, and again the movements were suspended, but a fresh contraction of the limbs of the right side took place. The behaviour of the chorea during the time the patient was subjected to various forms of treatment, is admirably detailed upon pages 158 and 159.

In one or other of these cases hemianesthesia and ovarian hyperesthesia were observed from time to time. Contraction of various organs was quite frequent, and was sometimes provoked by ovarian pressure, as in the case just detailed, and different visual disorders, such as amaurosis and disordered colour sense, were discovered, while hallucinations of vision were prominent in both cases.

Very little is said about treatment, and our attention is directed chiefly to such agents as nitrite of amyl, chloroform, ether, or valerianate of ethyl which stop the paroxysm. Ovarian pressure by means of the apparatus

like that occasionally used for the purpose of compressing aneurisms, is spoken of, and a plate is added to the text. Two hard pads, one of which has a concave surface to grasp the ovary, are used by Bourneville, and the use of this compression has been attended with interesting results, chiefly, however, of a scientific nature.

Metallo-therapy is spoken of occasionally, but very little is said in regard to this curious method of treatment, and we suppose the author's investigations are to be described hereafter.

The last case described by Bourneville is that of Génevieve, a *succube*, and those who have read the elder Balzac's story in *Les Contes Drolatiques* will enjoy the details of this case. Génevieve, whose portrait (Plate XXXIX.) represents a very melancholic, middle-aged woman, presents an example of demoniac possession, with certain very curious modifications of sensation. The feature of this patient's disease resembled those of Madeleine Bavart, who believed that she was visited by the Devil, who took the form of a cat; and in both of these cases the hallucination resembled very strongly those of delirium tremens, in which rats, cats, serpents, and other animals form the basis of the visual hallucination.

Numerous details of many interesting cases of demoniac possession are presented, and form a very attractive part of the book.

The peculiar surroundings of all of Dr. Bourneville's patients have been such as to lead to exaggerated manifestations of all kinds; in fact these women have been so frequently exhibited, "put through their paces," and commented upon, that the speculation immediately arises in our minds as to what might have been the character of the early attacks, and the possible difference from those presented during their career at La Salpêtrière, which are described by our author. This matter is worthy of consideration, and has much to do with the significance of the delirium stage. Then, again, a query suggests itself in regard to what might be the possible difference between attacks of hystero-epilepsy in women of other countries, who are not so emotional as the French, and whose religion is not so closely incorporated with the affairs of every-day life as it is in Roman Catholic countries; and this leads to the question whether hystero-epilepsy in Norway or Sweden, England or America is so marked by ecstasy, religious frenzy, and so often presents the "cruciflement." The few English and American cases do not show this. Dr. Thos. Anderson¹ reports a case in which there are none of the religious manifestations so frequently displayed in the French cases; and in cases reported by the reviewer² the absence of this phase of the delirium is the rule, but in a case since seen, the patient being a devout Catholie, the "cruciflement" is often presented. This is certainly suggestive of the fact that the delirium is almost entirely influenced by previous circumstances, belief, etc. The advance in our knowledge of these peculiar psycho-neuroses is certainly a great one, and these and other histories are of decided value in showing how many of the extraordinary religious beliefs of the past, and the superstitions of the present time, are entirely dependent upon complicated diseased states of the body and mind. We are consequently enabled to argue from much more firm and definite premises, when we appreciate the relationship (especially of the former) with these manifestations. The curious results of ovarian pressure, the provocation of the attack by bright lights, and pressure, such as has been described by Sigerson as *crisogenic*,³

¹ British Medical Journal, Feb. 8, 1879.

² Nervous Diseases, their Description, etc., Phila., 1878.

³ British Medical Journal, 1879, vol. i. pp. 145, 181.

supplies the link in the chain which is in connection with the bodily nervous trouble at one end, and mental disorder at the other.

Heretofore our arguments were to a great extent purely metaphysical, and consequently we were little better off than our opponents, who advocated the possibility of possession good or bad, who believed in the miraculous and the nonsense so dear to the credulous mind in search of mystery. What an amount of bigotry, folly, and injury to weak minds is counteracted by the discoveries and investigations of MM. Charcot and Bourneville it is not difficult to imagine. The false lessons inculcated by designing persons who have used the disordered bodily and mental states of stigmatisation, ecstasy, and the legion of dramatic hystero-epileptoid symptoms for purposes of deception stand a good chance of being completely and universally neutralized.

A. McL. H.

ART. XX.—*Cerebral Localization.*

Lectures on Localization in Diseases of the Brain. By Prof. J. M. CHARCOT. Edited by BOURNEVILLE. Translated by EDWARD P. FOWLER, M.D. 8vo. pp. 133. New York: Wm. Wood & Co., 1878.
The Localization of Cerebral Disease. By DAVID FERRIER, M.D., F.R.S., etc. 8vo. pp. 142. New York: G. P. Putnam's Sons, 1879.
Revue Générale des Sciences Médicales. Art. des Localisations Cérébrales Corticales. Par H. RENDU. pp. 298. 15 Janvier, 1879.

No subject during the last five years has attracted more intense and widespread attention from the medical world than that of cerebral localization. Rendu heads his admirable review with a list of more than a hundred works and articles published within three years. It is the great living question. Physiologists, pathologists, and physicians are deeply interested in the facts collected and the issues involved. We have a new phrenology, which is presented as a science and a system based, not upon crude speculation, but upon careful, laborious work, the value of which is not to be measured altogether by its direct fruits, whatever they may be. The names of Charcot and Ferrier, whose books are before us, are pre-eminent in the recent and important era of cerebral investigation.

The books of Charcot and Ferrier, although similar in title, are by no means alike in contents. Ferrier's volume, as the author states in his prefatory note, is the complement from a clinical and pathological standpoint of his former work on "The Functions of the Brain;" Charcot's contains matter essentially different from both of these. From the three works a complete idea of the subject of localization can be obtained.

Both books are issued in excellent style, and with illustrations so good that he may run that reads the lessons which they teach. Dr. Fowler's translation is indorsed by Charcot himself as a model both of scrupulous exactitude in rendition of the original meaning, and as a clear and unexceptionable style of English. No physician who aspires to keep pace with the advancee of his profession should be without these works.

Charcot's lectures, here presented, are only the beginning of an extensive series; but his preliminary work is of the very best character. They constitute an elaborate anatomico-pathological study of the brain, an "exposition of the principles underlying the doctrine of cerebral localization." The encephalon is well discussed from a morphological point of view; a

brief parallel is drawn between spinal and cerebral lesions; the cerebral circulation is dealt with by the most lucid of methods; hemianæsthesia, amblyopia, and hemiopia are examined; and secondary degeneration receives a short but satisfactory setting forth.

In his opening lecture, after a few introductory remarks, he explains the shape and plan of the brain. Ganglia, lobes, convolutions, and connecting tracts are clearly described, and the importance of an appropriate nomenclature is strongly emphasized.

The peculiar structure of the gray substance of the brain, discussed in Lecture II. and Lecture III., speaks strongly for the probable truth of the doctrine of specific localizations. We cannot do better than present some of the most prominent facts in regard to the histology of the convolutions.

In the first place, the gray substance shows certain general characteristics, being made up essentially of the same elements; but important relative deviations may be presented according to the region observed. The ganglionic, or nerve-cells, are the special elements of the gray cortex. These are in every way comparable to the motor cells of the anterior cornua of the spinal cord. They are generally spoken of as the pyramidal cells. They are variable in dimensions, most of them being relatively very small. They are usually arranged into three classes, according to size. The largest are called giant pyramidal cells, and have been carefully studied by Betz and Mierzejewski; they are found in certain well-determined regions. Their diameters sometimes equal those of the cells of the anterior horns of the cord. The essential structure of all pyramidal cells is the same. They have numerous prolongations. Each contains a nucleus and brilliant nucleolus.

Besides the pyramidal cells, small globular cells, sometimes furnished with prolongations, also exist in the gray cortex. These are generally sparse, although sometimes they form a tolerably thick layer. Some regard them as incompletely developed nerve-elements; others compare them to the constituents of the granular layer of the retina.

Meynert ranks also among the nerve-elements of the cortex a kind of elongated, generally fusiform, ramified cell, which probably belongs to the system of fibres which connects the convolutions.

An amorphous cerebral tissue, the neuroglia, serves as a uniting substance. This resembles the type of ordinary conjunctive tissue, conjunctive fasciculi, and flat cells. These elements which compose the gray substance are arranged in certain methods. The most common type of arrangement is that which is met nearly everywhere in the anterior lobes, and which presents five successive layers. Charcot's description and exposition of these five-layer stratifications of cellular nerve-elements are highly suggestive as regards the probable functions of different districts of the cortex.

The regions remarkable for the existence of the giant pyramidal cells are precisely those in which, in the monkey, according to Ferrier, the psycho-motor centres of the limbs are located. These comprise the entire ascending frontal convolution, the superior extremity of the ascending parietal convolution, and the paracentral lobule.

Some points of great interest are cited by Charcot in connection with the histological study of what he terms "the department of the *giant pyramidal cells or the motor cells par excellence.*" He gives, for instance, Lander's case of infantile spinal paralysis, in which autopsy revealed that the ascending convolutions were much shorter and less developed than normal, and that the paracentral lobule was entirely rudimentary. Landers believes that the development of the psycho-motor centres had been

arrested. The case of Luys is also quoted. In a subject in which amputation had been performed some years previous to autopsy, atrophy of the convolutions on the side opposite to the amputation was observed.

We have now in our possession a brain-specimen, awaiting microscopical examination, in which the ascending convolutions, paracentral lobule, and portions of the hemisphere posterior to the ascending parietal convolution, are notably atrophied and discoloured. The patient had had his leg, of the side opposite to that upon which these cerebral changes appear, amputated at least twenty years before his death.

An experimental observation of Soltmann is referred to by Charcot, to the effect that with newly born dogs the excitation of the psycho-motor regions produces no muscular movement in the corresponding limbs, whereas, some time after birth, towards the ninth or eleventh day, these points become excitable. Similar observations have been made since the publication of Charcot's lectures, and we incline to attribute to them great value. The fact that age, habits, and mode of life may greatly influence the size and development of encephalic centres has many important bearings. Recognizing its truth, we can account for some of the apparent anomalies and variations in size and position of centres in reported cases. The remarks with which Charcot terminates his consideration of this part of his subject are so full of suggestive interest that we cannot forbear quoting them :—

"The regions of the large cells belong to the five-layer type, and these regions have no definite anatomical characteristics except the presence of giant-cells. Now these giant-cells, morphologically, do not differ essentially from the large pyramidal cells, which also, according to the researches of Koschewnikoff, possess, like them, the nerve-prolongations in addition to the protoplasmic prolongations attributed to motor-cells.

"It seems natural to inquire if these cells, and even those of the smaller species, which are their miniature representatives, would not be capable, under certain conditions—under the influence, for example, of abdominal functional excitement—of acquiring development, and in that way giving birth to supplementary motor centres destined to replace primitive centres that by some lesion may have been destroyed. Thus, for example, might be explained how voluntary movements can be restored in a part, notwithstanding the destruction of a motor centre—a phenomenon an example of which is furnished in the frequent recovery from aphasia, in despite of the persistence of the lesion of the third frontal convolution."

The study of the cerebral circulation in the second part of Lecture IV., and in Lectures V., VI., VII., VIII., and IX., constitutes the most valuable portion of a valuable book. The vascularization of the encephalon is a subject of deep scientific interest, and, at the same time, of the most direct practical importance. The medical man, imbued with the proper spirit, can scarcely be engaged in a work more profitable and fascinating than the investigation of the arterial distribution of the brain. Charcot borrows largely from the work of Duret, a privilege to which he is certainly entitled, as this work was executed in the laboratory of Salpêtrière. At the beginning of his lectures on the arterial circulation in the brain, he steps aside to champion, apparently with some feeling, the cause of Duret against "a German doctor, Heubner." Duret and Heubner, unacquainted with each other, pursued their researches simultaneously, and in the most essential points arrived at identical results. Let us now quote from our author :—

"In a recent work treating of syphilitic alterations in the cerebral arteries, Heubner professes to have been the initiator. That is a claim which cannot be

sustained. The first researches of Duret relative to the circulation in the bulb and the protuberance were communicated to the Société de Biologie in the session of December 7, 1872.

"By a remarkable coincidence, the same day, the 7th of December, the *résumé* of the researches of Heubner upon cerebral circulation was published at Berlin in the *Centralblatt*. One month after, in January, 1873, Duret published a note in the *Progrès Médical* concerning that part of his researches which treated also of the cerebral circulation. The investigations of Duret are not, then, two years later than those of Heubner, as the latter insinuates; they are exactly contemporaneous. Of this fact Heubner might easily have convinced himself, as he has become acquainted with the last Mémoire of Duret, published in the *Archives de Physiologie* (1874), where the history of the question is given in detail.

"I have thought it well to insist upon this chronology," says Charcot with genuine Gallie spirit, "in face of the annexation mania, in order to establish the large part which belongs to our countryman."

In the exposition of the cerebral circulation, the question of the amount of communication between the different vascular regions of the brain is vitally important. Do anastomoses take place between the middle cerebral and the posterior cerebral distribution, between the anterior cerebral and middle cerebral, between the anterior and posterior, etc.? If these territories communicate, in what manner? To use the language of Charcot, "Are these communications easy and constant, or, on the contrary, are they accidental, indirect, and often impracticable?" The bearing of this problem upon the prognosis of cerebral thrombosis and embolism will at once be recognized. It is a question of life or death as regards the areas supplied by occluded vessels.

According to Duret, the main vascular territories of the brain are, in great measure, independent and isolated; communications between them are difficult or impossible. Heubner, on the other hand, believes that these are very easy, that they are made by the mediation of vessels not less than a millimetre in diameter. According to Duret, what anastomotic circulation is present takes place chiefly or exclusively through the capillaries. Charcot coincides with the conclusions of Duret, believing that they are more in conformity with pathological facts than those of Heubner. Cohnheim also agrees with Duret. He holds that the arteries of the encephalon, if not *final* or *terminal*, very nearly approach that type. By *terminal* or *final* arteries are meant those arteries or arterioles which, between their origin and their capillaries, neither furnish nor receive any anastomosing branch. The ramifications in the pia mater, the nutrient arteries of the cortex, and the vessels of the central ganglia, are believed to belong to this class.

Our own clinico-pathological observations are in the main strongly corroborative of the views of Duret, Cohnheim, and Charcot, however pleasant it might be to coincide with Heubner, whose opinions would enable us to give more roseate prognoses and to infuse more hope into our therapeutics. In exceptional cases, however, more or less easy communication takes place between arterial provinces usually isolated, which accounts for the pathological cases cited by Heubner, in which obliteration of one of the vessels of the cortical system or of its branches has, during life, given no evident symptom, and in which such obliteration causes no softening. At a recent autopsy, we saw a striking case of this kind. The artery of the ascending parietal convolution was completely obliterated in its middle third, and yet no softening of the convolutions beyond could be discovered on the closest examination. The patient had been a right hemi-

plegia, this condition being probably accounted for by an old cyst in, and extensive softening of, the left corpus striatum. In such a case, either collateral circulation must have been somewhere established, or the occlusion of the vessel, although probably for a long time partial, was not complete until just before death, and hence sufficient time had not elapsed for discoverable softening to occur. This latter mode of explanation of some of the apparently exceptional cases seems to us not at all unreasonable. The condition of the blood, and the rate of its flow, about the time of dissolution, might favour those final deposits on the diseased inner walls of vessels which would cause their complete closure.

The fact to which Duret has directed attention, of the frequent variations and anomalies of the circle of Willis and the communicants, is of practical value, and is one which we have often observed. If we do not bear it in mind, we may be led to false conclusions in cases of softening, hemorrhage, etc., in regard to the manner and method of communication between the different vascular territories of the brain. In searching for the arterial cause of necrosis, it must always be remembered that the communicants, as Duret informs us, are often filiform and entirely insufficient to re-establish circulation in case of obliteration. According to him, also, certain forms of anomalies explain cases of softening of an *entire hemisphere*, by a clot obliterating the internal carotid near its bifurcation. This softening of an *entire hemisphere* we must beg leave to doubt, although a large portion of a hemisphere may in this way be destroyed.

The very nature of the circulation in the brain, so well discussed in these lectures of Charcot, might, perhaps, be looked upon as an argument in favour of localization. The brain more than almost any other organ has specific regional supplies of blood; and, in accordance with the principle of the adaptation of parts to purposes, we might expect these districts which are furnished with special and peculiar vessels, to have functions specific and peculiar.

Intra-encephalic hemorrhage claims from Charcot the attention which it deserves. We will glance at only a few of the points. He divides the external striated arteries into an anterior and a posterior group. One of the anterior arteries is especially important, because of its size and its predominant rôle in intra-encephalic hemorrhage, and could, he says, be appropriately called the *artery of cerebral hemorrhage*. The method of studying this and all other vessels is minutely given. His observations on regional diagnosis, with reference to vascular supply, intra-encephalic hemorrhage, and occlusion of vessels, throw a flood of light upon a subject which is shadowy to most professional minds.

In the tenth lecture a fine comparison is drawn between hysterical hemianæsthesia and amblyopia which are due to cerebral lesion. His standpoint, which differs from that of many other observers, is laid down in the proposition that *cerebral lesions of the hemispheres which produce hemianæsthesia produce also crossed amblyopia, and not lateral hemiopia*. Charcot's hypothesis of double decussation of the optic fibres, now generally known, is here presented. A curious historical fact is mentioned in this chapter. It is, that the hypothesis of the semi-decussation of the optic nerves, usually attributed to Wollaston, is really due to Newton, who expressed it in 1704, in his *Treatise upon Optics*, and which Vater, in 1723, employed to explain three cases of hemiopia which had fallen under his observation.

Charcot's remarks on the analogies and differences between lateral sclerosis from cerebral cause and primitive fasciculated sclerosis of the

lateral fasciculi of the cord, are as suggestive as they are interesting. Most of the points indicated are now well known to the profession ; but an important matter, often overlooked, is the fact that the consecutive sclerosis resulting from cerebral lesion acquires, after a given time, a sort of independent or automatic existence.

We lay down this well-translated volume, impressed anew with the genius of Charcot.

The work of Ferrier, which is made up of the Gulstonian lectures of the Royal College of Physicians for 1878, revised and supplemented by numerous additional facts and illustrations, contains some of the matter to be found in *Functions of the Brain* ; but this is not to be deprecated, as it has been re-presented not for "padding," but for clearness and fulness of exposition. In Lecture I., after an argumentative and historical statement of the question of localization, lesions of the frontal lobes receive brief attention ; in Lecture II. and the first part of Lecture III. lesions destructive and irritative of the motor zone are ably and fully set forth ; and in the remainder of Lecture III. the areas for common sensation and the special senses are discussed.

Ferrier's exact position is not always understood, particularly by those by whom he is criticized. In regard to motor phenomena, he believes that the cerebral convolutions surrounding the fissure of Rolando contains psycho-motor centres, or centres for movements which involve conscious discrimination, which are volitional in the strict sense of the term. They are not purely "motor" centres, that is, centres for all movements of all kinds. "Those which are variously described as automatic, instinctive, or responsive, including all the motor adjustments concerned in equilibration, locomotor co-ordination, and instinctive emotional expression, are more or less completely and independently organized in the centres situated below the cortex."

He holds to the probable existence in the *præ-frontal* lobes of psychical centres. He advocates sensory localization, locating the sensory centres in the parieto-temporal region, situated between the motor-area and the occipital lobes, and including the supra-marginal lobule and angular gyrus or inferior parietal lobe, the convolutions of the temporo-sphenoidal lobe on its external and interior aspect, viz., the superior, middle, and inferior temporo-sphenoidal convolutions, the occipital temporal convolutions (lingual lobule, fusiform lobule), the uncinate gyrus, and hippocampus major or cornu Ammonis. In regard to the occipital lobes, his hypothesis is that they are specially related to the visceral or organic sensibilities.

His views also in regard to the functions of the great basal ganglia—the corpora striata and optic thalmi—can be briefly stated. From the cortical centres fibres pass down to the cerebral peduncles; broadly speaking, these ganglia are so placed in connection with these conducting bundles as to have the position, anatomically and physiologically, of bodies intermediate between the centres of the cortex and the parts below the hemispheres. Volitional movements originate in the gray superficial layers of the brain; these movements are more or less distinct and dissociated according to the centres in action. They may become automatic or organized.

"Movements," says Ferrier, "at first requiring true volitional effort—by which is meant action conditioned by consciously discriminated impressions present or revived—tend to become automatic by repetition, and the less varied and complex the movements, the more speedily does this automatic organization become established. It is evident from the facts of experiment on dogs that the

corpora striata are the centres in which this organization occurs. They form, as it were, the centres of automatic or sub-voluntary integration of the various voluntary-motor centres differentiated in the hemispheres." (*Functions of the Brain*, p. 252.)

The basal ganglia do not initiate either motor or sensory impressions, but they serve to receive and organize, to co-ordinate and harmonize, impressions originating in the scattered centres of the cerebral periphery. They are largely concerned with actions which have become habitual and automatic.

By far the strongest part of Ferrier's work is that which is concerned with motor phenomena. This is, of course, the phase of the general subject of cerebral localization, which, for many reasons, has been best worked out. These phenomena are objective; paralysis and spasm can be seen as well as experienced; the motor convolutions are easily reached by the physiologist, and are often the victims of disease.

The weak part is that which treats of lesions of sensory regions. Illustrative cases are far less numerous and convincing than those which speak for the motor areas. Some of the reasons for this are plain. Sensory phenomena are subjective; they are less readily determined by the physiologist, and are more apt to be overlooked by the physician. We fully agree with Ferrier, who, in speaking of the want of attention to certain sensory manifestations, asserts that the "latency has been in observation rather than in symptoms." Again and again, both in ward and in outdoor hospital service, we have seen most important sensory affections passed by, sometimes temporarily, sometimes altogether. The average clinical investigator does not always possess the time, tact, and patience required for such work.

The ground taken in regard to the antero-frontal lobes, of the existence in them of psychical and inhibitory centres, is well sustained by cases and arguments, old and new. In the *Medical Times* for January 18, 1879, we published a case of frontal tumour, which, we think, favours the views of Ferrier, although it has been urged against it that, being a case of tumour, deductions in reference to localizations are not trustworthy. We believe, however, that careful analytical study will sometimes enable us to separate the general from the special phenomena of tumour cases.

The review of Rendu—himself a contributor to the facts as well as to the literature of cerebral localization—is a comprehensive and logical presentation of the subject. His standpoint can be judged from the following statement of this object:—

"We shall try, in this review, to show that the different suppositions by which it is sought to replace the theory of Ferrier, are much less plausible than his view, and that they do not rest on anything more certain. We see that the light is still far from being perfect regarding the intimate mechanism of the cerebral functions, and the calling into play of encephalic manifestations; nevertheless, the theory of cortical centres is the most acceptable; assuredly, it is that which is least in disaccord with clinical phenomena."

He discusses the subject in its physiological, pathological, and clinical aspect. Under the head of Physiology, he gives at length the views of Ferrier, and also those of his opponents—Brown-Séquard, Lussana and Lemoigne, Vulpian, Dupuy, and others.

First in importance are the very positive opinions of Brown-Séquard, according to whom the brain is composed of innumerable reflex centres, which are put into action by a multitude of different influences, intrinsic and extrinsic. His chief conclusions, now so well known, are that a lesion

limited to one-half of the brain, can produce symptoms on either side of the body; that a small lesion, whatever its seat, can produce the most extensive and violent symptoms; that a lesion on both sides of the median line of the brain can produce symptoms only on one side of the body; that sudden symptoms can proceed from a slowly progressive lesion, and *vice versa*; that the most diverse symptoms can proceed from an invariable lesion, and, reciprocally, lesions of diverse seat can give rise to the same symptoms; that permanent lesions can produce periodical or transient symptoms; that some cerebral symptoms have their origin in an irritation of the viscera or peripheral nerves; and that, finally, enormous lesions can exist in all parts of the brain without determining any symptoms.

These contradictory facts, according to Brown-Séquard, show that nerve cells possessed of definite functions, instead of being united in a certain cerebral territory, are dispersed throughout the encephalic mass, and are joined in some way one to the other, so as to form a functional solidarity. Each cerebral hemisphere, he believes, is a complete brain, sufficient of itself for the control of both sides of the body, but most individuals do not develop equally their two brains. The clinical conclusion to be drawn from such a view is that all symptomatic manifestations of cerebral origin arise exclusively from an irritation which acts, either by arresting the activity of the encephalon, or by exaggerating it. To the first category of symptoms belong, for instance, paralysis, aphasia, anaesthesia, amaurosis, etc.; to the second, delirium, convulsions, contracture, tremor, etc.

Rendu remarks very forcibly that in order to deny the results obtained by Ferrier from physiological experiments, it is necessary that conditions shall be identical. Brown-Séquard's experiments were performed on dogs, rabbits, and cobayes, and every one admits that hemiplegia in these animals, after destruction of a hemisphere, is far from being regular. In regard to his pathological data, he shows that Brown-Séquard has accumulated systematically all the facts and supposed facts unfavourable to the idea of a localized affection. Many of these have little or no value. Only a few are well established and irreproachable. Rendu asks, with reason also: Can a hundred observations suffice to render valueless daily clinical experience, and the thousands of cases which come to the notice of all physicians engaged in hospital practice?

The researches of Pierret and Flechsig, dwelt upon by Ferrier, but, strange to say, not alluded to in Rendu's able review, undoubtedly afford to the advocates of localization one of the most satisfactory explanations of Brown-Séquard's much flaunted exceptional cases of direct paralysis, that is, of paralysis occurring on the same side of the body as the lesion in the cerebral hemisphere. Flechsig has shown by embryological research that the decussation of the anterior pyramids at the junction of the spinal cord and medulla oblongata, instead of being regular, is very variable. His investigations were made upon the spinal cords and brains of sixty foetuses. According to him the pyramids are adjuncts to the fundamental spinal tracts, and are developed later, their development coinciding with that of the hemispheres. They are absent in cases of non-development of the hemisphere. They can be traced above to the cortical regions and below to the postero-lateral, and partly to the anterior columns of the cord. As a rule, the fibres which decussate descend in the postero-lateral columns, and those which pass down directly into the cord do so in the anterior columns. Usually, in Flechsig's research, the crossed bundles predominated over the direct. Variations were very numerous; occasionally the direct fasciculi exceeded the crossed. In one case all the pyramidal fibres

crossed the median line to the lateral columns, in another only ten per cent. crossed over, ninety per cent. descending directly in the anterior columns. Flechsig believes it possible for the decussation of the pyramids to entirely fail.

Pierret (*Bull. Soc. de Biologie*, Jan. 8, 1876, *Le Progrès Méd.*, Jan. 22, 1876) describes the case of a child in which almost the whole of the pyramidal strands were contained in the anterior columns as far as the middle dorsal region. In this case, in consequence of the almost complete absence of decussation, M. Pierret remarked that, had paralysis occurred as the result of a cerebral hemorrhage it would have shown itself in the arm of the same side, while the opposite leg would have been but slightly affected.

How much more satisfactory are explanations based upon these anatomical facts than the inverted reasoning and special pleading of Brown-Séguard? These variously decussating pyramids being the paths for the transmission of voluntary impulses, paralysis on the same side of the body as a brain lesion is possible, and does not constitute an unanswerable argument against the first and oldest fact in cerebral localization, that of the cross action of the cerebrum. In a word, the classical idea of hemiplegia has not been successfully assailed.

MM. Lussana and Lemoine hold that the white substance possesses the properties attributed by the advocates of localization to the gray. They say first that the cerebral cortex does not contain motor centres, and that its lesions do not produce paralysis; and secondly, that the peduncular system contains the true centres of motor innervation; that a lesion of this system always causes paralysis; if, sometimes, paralysis follows from a surface lesion, this depends always on indirect compression or on counter-pressure on the peduncular system. They completely deny the psycho-motor centres of Ferrier. They base their views first on the fact that the cortex responds only to electrical and not to mechanical or chemical stimuli, the peduncular fasciculi responding to all. This argument, Rendu shows, really proves nothing against the existence of psycho-motor centres. It simply appears that the gray substance does not comport itself in the same fashion as the white under diverse excitations, but this is the only legitimate conclusion that can be drawn. A second reason for neglecting the centres of Ferrier is the transient and incomplete character of the paralysis or paresis following lesions of the cerebral cortex. This objection, however, says Rendu, is more specious than real, if we reflect on the modifications of structure which the brain undergoes in the various degrees of the vertebral scale; if we especially think of the antagonism which Ferrier has shown to exist between the centres of voluntary innervation and the automatic motor centres. By admitting with most physiologists that the cerebral peduncles are only conducting bundles, emanating from this double series of centres, it is clear that their section would be followed by complete paralysis; but we cannot conclude from this that the peduncles are true motor centres.

We might say just here, as probably the most appropriate place, that the objection to cerebral localization and its physiological proofs, which has been so often advanced, namely, that it is impossible to localize the action of electric currents is far from having the weight which many suppose it to possess. Ferrier states this point well—

"On the conduction theory it would be natural to expect that the nearer we go to the underlying ganglia and tracks, the more readily the effects should be called forth if it were a question of mere resistance of currents. But we find

that electrization of the island of Reil, which is nearest the basal ganglia, is absolutely negative; while electrization of the more distant postero-parietal lobule by the same stimulus produces an immediate and definite movement. Conduction would seem to be put out of court by such facts. And we find, as Carville and Duret have shown, that the intervention of a fluid cyst between the cortex and the basal ganglia is quite sufficient to interpose a fatal obstacle to the preparation of functional stimulation, though not of electrical currents, just as a ligature round a nerve will stop neurility but not electricity."

Vulpian has adopted an opinion intermediate between that of Ferrier and Brown-Séquard. Establishing himself on the inexcitability of the gray substance in general, he concludes that all parts of the encephalon possess the same physiological properties. He has, however, repeated the experiments of Hitzig and Ferrier, and has recognized the existence of regions excitable by electricity, and giving rise to determinate movements. It is, therefore, rational to admit that to these regions come fibres exclusively motor, in intimate relation, on the one hand with the cerebral cortex, and on the other with the corpus striatum. The integrity of the gray substance is necessary to that of the nervous elements of the white substance which joins it. Irritation of deep-lying parts excites the superficial convolutions.

Dupuy has sought to prove that the contractions obtained by stimulating certain convolutions are only reflex phenomena, that they are due to irritation of the nerves of the pia mater and of the vessels. He founds his opinion upon such experiments as the following: He exposed the left hemisphere of a dog at the level of the fissure of Rolando, and faradized the adjacent convolutions, producing manifest movements of the right side. This done, with a white-hot cautery, he touched the motor centres still covered by the pia mater, and then again applied electricity to the parts cauterized, obtaining the same movements. The animal presented no paralysis save a little ptosis. At the end of four weeks it was absolutely cured, without any affection of motility or sensibility. Dupuy now reopened the wound and established the presence of a dried eschar adhering to the meninges. Electrical excitation of the eschar and of the subjacent fibres now provoked no movement, while the current applied around the eschar caused muscular contractions. Dupuy's conclusion, according to Rendu, is by no means unassailable. In the first experiment, irritation of the cauterized region induced movements, because the subjacent fibres were sound; later, these being destroyed, all transmission of peripheral excitation to central parts disappeared. Thus interpreted, the experiment rather supports the theory of cortical motor centres, but with the restriction of Vulpian, a restriction which Rendu is inclined to accept.

The re-establishment of motor functions after the destruction of cortical centres is discussed by Rendu. He recalls the opinion of Broadbent, that in such cases the opposite hemisphere at once effects a work of compensation; but in opposition to this, he also refers to the remarkable experiment of Carville and Duret, who cured a temporary paralysis consequent upon an operation upon one cerebral hemisphere by extirpating the cortical centres of the other side. He believes Ferrier's explanation of these phenomena to be the most plausible. Supporting himself on his physiological views of the respective rôles played by the cortical centres and the basal ganglia, he holds that the latter, especially the corpora striata, are so organized as to act when the functions of the convolutions are in default; automatism taking the place, in such cases, of voluntary impulses. Thus can be explained the numerous differences which are seen in different

species of animals after ablation of the encephalic cortical centres. A monkey, after this operation, becomes and remains hemiplegic; a dog is only transiently paralyzed, a pigeon is not paralyzed at all—and so on for different animals, according to the degree of their volitional and automatic organizations.

A large number of facts, pathological and clinical, have been collected, and are presented by Ferrier and Rendu; a few are given in the lectures of Charcot. These are particularly full and convincing in regard to destructive lesions of the motor areas. Case after case is given to show that paralysis of the muscles of the face, arm, or leg, may be the result of circumscribed lesions of the motor zone. It will not be necessary, except in special instances, to recall these cases. They have been quoted everywhere in current medical literature. The facts in regard to brachial and facial monoplegia are overwhelming; and brachio-crural monoplegia is a condition well made out. It may be, in reference to crural monoplegia, that we are simply in need of more numerous and accurate observations. The long-established doctrine of aphasia is re-emphasized by Ferrier with striking illustrations. One point made by him is worthy of special notice:—

"To overturn," he says, "the localization of a speech centre, it is not enough to bring forward a case of lesion of the left speech-centre without aphasia. This is admitted by all, and it is a very significant fact, that in several at least of the cases of aphasia with disease of the right speech-centre, the patients have been left-handed. It is incumbent upon the opponents of the doctrine of localization to bring forward a case in which, with bilateral lesion of this centre, no aphasia occurred. But, I need scarcely say, no such evidence exists."

The atrophy which occurs in certain cerebral regions because of the prolonged functional inertia which results from amputation or other cause; the secondary degenerations which follow lesions of the motor zones; the negative, but not unimportant argument, of the existence of latent cortical zones—these facts present other lines of reasoning well worked out by Ferrier and Rendu, but to these we have already referred.

The facts in regard to irritative lesions of the motor area strengthens at every point the position of the localizationists. In this field the labors of Hughlings-Jackson are pre-eminent. A knowledge of "Jacksonian epilepsy" is one of the recent signal acquirements of neurology. The pathology and symptomatology of irritative motor lesions point unerringly to the existence of cortical centres. It should never be forgotten that to Hughlings-Jackson belongs the great credit of having first indicated the motor functions of certain cortical regions, having been led up to this by observation of the phenomena of unilateral cerebral convulsions.

We are somewhat surprised that our author and the reviewer have not made more use of the numerous investigations into the symptomatology and pathology of dementia paralytica—of the researches of Meynert, Hitzig, Huguenin, and others. These are in the main confirmatory of the doctrine of localization. Ferrier contents himself with a mere allusion to the observations of Dr. Crichton-Browne on General Paralysis of the Insane.

We may, perhaps, be permitted to refer, at this point, to some cases of our own. This will be the more allowable because the observations were published too late to receive the attention of Ferrier and Rendu. In these cases (*Philadelphia Medical Times*, March 1, 1879) the symptoms produced by cortical lesions were, in the main, in accordance with the views of Ferrier, Charcot, and their school. They seemed to indicate, however, that the centres for leg, arm, and face are not so strictly and absolutely isolated in every human being as physiological experiment might lead us

to suppose. In one case, for instance, aphasia, partial right facial paralysis, marked paralysis of the right upper extremity, and paresis of the right lower extremity, were the results of softening confined to a small portion of the hinder part of the third frontal convolution, the lower end of the ascending frontal, the island of Reil, and a narrow segment of the adjoining temporal convolution. The major portion, but not all, of the region usually assigned to arm and hand movements, and the entire leg-centres, as usually given, escaped. In the second case paresis of the left face, arm, and leg, with left local spasmoidic seizures, accompanied a lesion which distinctly involved portions of leg, arm, and face centres, and, therefore, it might be looked upon as strictly corroborative of the asserted facts in regard to localization. The third case was one of right hemiplegia with aphasia, partial hemianæsthesia, and unilateral convulsions, the lesion being softening of small outer rim of the island of Reil, a posterior segment of the third frontal convolution, the lower thirds of the ascending frontal and ascending parietal convolutions, the upper border of the first temporal convolution, the Sylvian border of the lower parietal, and the posterior portion of the upper parietal convolution. Except that the usually given leg-centres, high up in the ascending convolutions, were not involved, this case was one strongly confirmatory of Ferrier's views in regard to localization.

It might be here remarked that, on the whole, as Ferrier has noted, the centres for the movements of the leg have not been as clearly located and differentiated as those for the arm and face. The fact that in cases of paresis or paralysis of the arm or leg of cortical origin the lesion found does not occupy the *entire* area for the movements of these members does not necessarily militate against the view that these are the true centres for the limbs. In many instances the effects of a lesion doubtless extend beyond its strict limits. We have also thought that a sort of physiological coalescing or interaction of centres might sometimes take place. The movement of the leg and arm of one side being so constantly associated the centres for one may, to a certain extent, become capable of governing both. This, at least, is a view worth considering. Another point to be borne in mind is that, while the arm often acts independently of the leg, the latter is far less independent of the former in its movements. We write, strike, lift, and perform numerous acts with the upper extremity alone; but in walking, running, etc., the arms, as well as the legs, have parts of their own to perform. This may help to account for the fact that brachial and brachio-crural monoplegia are of much more frequent occurrence than pure crural monoplegia.

Our cases of lesion of the frontal lobes, of the basal ganglia, and of other encephalic regions besides the motor zones, also, on the whole, tend to the support of the doctrine of cerebral localization. Some of these are given in the article just quoted from; others have been presented, in connection with specimens, to the Philadelphia Pathological Society during the last and the present year, and have also been published in the Proceedings of this Society in the *Medical Times*; still other cases of both cortical and other lesions remain as yet unpublished. In short, out of more than a score of cerebral autopsies, made upon cases studied during life, we have only had two that seemed decidedly to conflict with the localization theories. One of these was a case of tumour of the brain (*ibid.*, March 29, 1879), which was situated in front of the optic chiasm, and the symptoms were chiefly those of marked left hemiplegia. The other was a case observed within a week of the time of writing, and it will hereafter be published

in detail. Softening of the pons, occupying both sides of the median line, was found, the patient several weeks before death having become paralyzed on the right of the body, the paralysis spreading just before death to the other side. Both of these cases, however, *can* be explained in conformity with the principles of localization. Tumours, owing to the general irritation which they often exert, and to the pressure-effects which result from them, sometimes give rise to symptoms which are apparently, but not really, in opposition to the view of the specific localization of functions.

Notwithstanding the immense additions which have been made to our knowledge of the physiology and pathology of the brain, especially with reference to the localizations of functions and lesions, the diagnosis of cortical paralysis from paralysis due to destruction of the corpus striatum or internal capsule, is not always easily made during life. This is pointed out by Ferrier in regard to hemiplegia depending on general destruction of the motor area of the cortex, and hemiplegia due to destructive lesions of the corpus striatum, more particularly those involving the anterior two-thirds of the internal capsule.

"There is the same relative affection of the different movements; those being most paralyzed which are most volitional, at least after the first rude shock of the disease has subsided. The facial paralysis is seen especially in the lower facial regions or in those movements which are most independent, while the frontal and the orbicular muscles of the eye are but slightly affected. The movements of the leg are less paralyzed than those of the arm, and the proximal movements of the arm less than those of the hand. Sensation is not affected if the lesion be strictly limited to the cortex or to the anterior two-thirds of the capsule; and in neither case is the nutrition or the electric contractility of the paralyzed muscles directly impaired. The same tendency exists to the development, sooner or later, of descending sclerosis of the motor tracts of the crus, pons, medulla, and spinal cord, and the appearance of late rigidity or contracture of the paralyzed limbs."

While all this is true, in a general sense, as Ferrier states, yet we are convinced that a very careful study of the two classes of hemiplegies will reveal points of dissimilarity which will largely help to a regional differential diagnosis. Fortunately, too, as Ferrier states, hemiplegia, complete from the first, and permanent, is not the most common type of paralysis depending on lesion of the cortex or subjacent medullary fibres.

"More frequently paralysis of cortical origin is fractional or dissociated, or is a succession of dissociated paralyses or monoplegia. In cortical affections we frequently find a hemiplegia, at first complete, resolving itself into a monoplegia, or a monoplegia becoming a hemiplegia by progressive advance of the disease to other motor centres. This latter is a significant indication of cortical disease. Paralysis of voluntary motion of the arm or leg, of the arm and face, or this combined with aphasia, if the lesion be in the left hemisphere, or paralysis of the inferior facial region, of the arm alone, or of certain movements of the hand and arm, or of the leg alone, without affection of sensation, and without qualitative or quantitative changes in electrical contractility, or direct impairment of nutrition, may be looked upon as depending on lesions of the cortex or subjacent medullary fibres."

Other points in diagnosis given by Ferrier are, the association with monoplegia, of monospasm and early rigidity, and convulsions sometimes in the limbs not paralyzed; the frequent erratic and transitory character of cortical paralysis; the fact that consciousness is less frequently lost in cases of sudden cortical lesion than when similar disease occurs in the central ganglia; the fact, noticed by Callender and others, that cortical

lesions are more frequently accompanied by localized pain in the head, and that observed by Ferrier himself, that even when pain is not spontaneously complained of, it may be brought out by percussion over the seat of lesion.

Ferrier closes his remarks on the diagnosis of cortical paralysis by the following condensed statement :—

" While we cannot be quite certain of the position or extent of a cortical lesion causing a sudden and complete hemiplegia, we may take a monoplegia of the leg or of the arm and leg as an indication of lesion of the upper extremity of the ascending convolutions close to the longitudinal fissure ; brachial monoplegia as a sign of lesion of the upper part of the ascending frontal convolution, or, if the paralysis affect the hand more particularly, of the ascending parietal convolution ; brachio-facial monoplegia as indicating lesion of the mid-fronto-parietal region ; while facial and lingual monoplegia, or this combined with aphasia, indicate lesion of the lower part of the ascending frontal convolution, where the third frontal unites with it."

In discussing the question of the exact topographical diagnosis in cases of cerebral lesion, we cannot afford to overlook thermometry, general and local, and in local thermometry, the results obtained by taking head temperatures, and the temperatures of various local areas scattered over the body. Ferrier summarizes a few points. Although there is some difference of opinion, it is generally stated that there is less difference in temperature between the two sides when the paralysis depends on cortical than on central disease, and subsides more rapidly. Eulenborg and Landois, and Hitzig, hold that vaso-motor paralysis occurs in dogs, in consequence of destruction of the cortical motor centres. Vulpian and Küssner contest these facts. Ferrier believes the discrepancies to be more apparent than real, and that the same law holds good in reference to vaso-motor paralysis, which is observable in reference to the degree of motor paralysis following cortical lesions in different animals, and in respect to different movements in the same animals.

Broca, in 1877, published some observations on the temperature of the surface of the head in health and in disease, the observation indicating the possibility of determining local intra-cranial temperatures by applying thermometers externally. Lombard and others have experimented in a similar way with the thermo-electric pile. In the *New York Medical Journal* for August, 1878, Dr. Landon Carter Gray, of Brooklyn, has an article on *Cerebral Thermometry*, read before the American Neurological Association, June 20, 1878. In this paper he gives the results of observations upon 102 males, taking the temperatures of various regions of the head, left and right, frontal, parietal, occipital, etc. Among other things he found the average temperature of the left side of the head to be nearly a degree higher than that of the right ; and the average temperature of the frontal and parietal regions to be nearly two degrees higher than that of the occipital. He refers to a case of tumour of the brain, occurring in the practice of Dr. Frank W. Rockwell, of Brooklyn, in which the diagnosis of the locality of the intra-cranial morbid growth was made with a thermometer, and afterwards verified by a *post-mortem* examination. Rendu, referring to the researches of Gray, says, that he believes that they do not prove anything except the existence of certain peripheral vaso-motor centres ; that they do not demonstrate that the temperature of the head, in the various zones examined, corresponds to that of the brain ; that perhaps they are simply explained by the richness and the greater or less superficiality of the arterial supply to the different regions of the scalp.

We are strongly inclined, from some experience in cerebral thermometry, to think that the criticisms of Rendu are not tenable, and that therefore the observations of Broca and Gray are of value as directing us to new aids in making regional diagnoses. In a case of brain tumour reported to the Pathological Society of Philadelphia (*Philadelphia Medical Times*, Jan. 18, 1879), we give a series of observations made with surface thermometers upon the head, which seems to show that we can attribute a positive value to local cerebral thermometry. The temperature of the surface near the seat of the growth was higher than that of other regions. We also have made a series of observations on another case of cerebral tumour, and numerous investigations in local and general thermometry in cases of hemiplegia, monoplegia, etc., all of which tend to show the value of such observations for the purposes of localization.

The study of localization has more than one hopeful therapeutical aspect. The supplementing of action by different parts of the encephalon is one of the sanguine prospects. This supplementation, as has been pointed out by Charcot and others, may take place between motor centres and ganglia, between various ganglia, and even between various parts of the same ganglion.

Duret's magnificent studies upon cerebral traumatism constitute a portion of the practical outflow from this new epoch of brain investigation. His theory of cerebro-spinal shock is of itself a discovery of sufficient importance to justify all the labours of all the localizationists. This same author and worker in the field of localization has given us new points of value in the diagnosis of diseases of the cerebral membranes.

In a review of this kind, we would fall short of justice to our subject, if we failed to refer to the direct surgical applications of the principles of localization. Although the instances in which the surgeon has been aided by the facts of localization are few in number and often quoted, they are none the less important and suggestive. Broca succeeded in locating an abscess in the third frontal convolution. Trehphining has been performed in one case by Proust and Terillon, and in another by Lucas Championnière, the places for operating having been selected from a study of the symptoms of cortical lesions presented by the patient. The possibility of operating successfully in cases of cerebral abscess the position of which might be determined by a study, in the light of localization, of the phenomena of spasm, paralysis, or sensory disorder exhibited, has been proved by several reported cases. Huguenin mentions a case of this kind. Dupuytren operated successfully on one case of abscess of the hemispheres, and other similar cases are to be found in surgical treatises and memoirs.

In conclusion, we would simply say, that we are bound by the weight of evidence from every hand to give our unqualified assent to the doctrine which is embraced in the terse proposition of Charcot :—

"The encephalon does not represent an homogeneous organ, a unit, but rather an association, or a confederation, composed of a certain number of diverse organs. To each of these organs belong distinct physiological properties, functions, and faculties. Now the physiological properties of each one of these parts being known, it becomes possible to deduce therefrom the conditions of a pathological state; this being of course but a greater or less modification of the normal state, and not the result of the intervention of new laws."

In our opinion, "la belle doctrine" of cerebral localization is founded upon facts and principles which have not been, and probably cannot be, successfully gainsaid. It has withstood sneers and scepticism, and each day grows in favour as it grows in strength.

C. K. M.

ANALYTICAL AND BIBLIOGRAPHICAL NOTICES.

ART. XXI.—*The National Dispensatory. Containing the Natural History, Chemistry, Pharmacy, Actions and Uses of Medicines, including those recognized in the Pharmacopæias of the United States and Great Britain.* By ALFRED STILLÉ, M.D., LL.D., Professor of Theory and Practice of Medicine in the University of Pennsylvania, and JOHN M. MAISCH, Ph.D., Professor of *Materia Medica* and Botany in the Philadelphia College of Pharmacy. 8vo. pp. viii., 1628. Philadelphia: Henry C. Lea, 1879.

THE appearance of a “National Dispensatory” is a matter of national importance. Presuming to speak, as a Dispensatory must, with quasi-official authority, a new work of this kind must be the offspring of unquestionable parentage, else it will find few to back it in its race for life. That Professors Stillé and Maisch have earned the right to father such a child, none will gainsay, and one therefore opens the pages of this portly volume with a confidence which it is rarely safe to feel concerning a new medical book.

Familiar as we all are with our trusty “Wood and Bache,” the special features of the new work are most easily pointed out by a comparison. On opening the book, the first thing we look for is, of course, to find whether, in the order of titles, we have to deal with one alphabet, or two or three; whether we can at once turn to a stated heading, or whether, as of old, we must first bethink ourselves if the drug in question be officinal or not, and, still further, whether *made* or *bought* by the dispensing apothecary. We look, then, and are glad to find that the three-alphabet relic of barbarism is done away with, and a single alphabet, according to the Latin names, adopted as the basis of arrangement of titles. The next most novel feature is the introduction of wood-cuts, and good ones, illustrating the look, gross and microscopic, of important drugs or plants. Another happy innovation is, that under the title of each article of the *Materia Medica* are enumerated *all* the medicinal preparations of the same, whether made directly from the crude drug or from some pharmaceutical derivative thereof. In chemical matters, the modern symbols are used, but the hybrid nomenclature of the last Pharmacopœia is followed, not only in the officinal naming of the drugs, but also in the current text, a necessity which it is fervently to be hoped will not now much longer endure.

In other respects the general plan of the work is analogous to that of the “Dispensatory of Wood and Bache”; the aim being to give, in relation of drugs, both officinal and non-officinal, all the facts that concern the druggist and physician. In a general way, the chemical and pharmaceutical matter is more condensed than in the older work, while the physiological and therapeutic is considerably more ample. In the latter connection there is also the new feature of a therapeutical index of formidable size. This addition may, perhaps, be sometimes a convenience, but we cannot but think that, on the whole, such indices are of questionable advantage. For there is ever present the danger that the young practitioner will—not unnaturally—construe the index into a *therapeutical abstract*, and blindly employ special remedies for special diseases, simply because the names are herein placed in mutual relation.

In a book of this kind, anything like an extended review is obviously out of the question. So that, having pointed out the special features of construction, it remains but to pass opinion on the performance. And it is a case where the jury do not need to retire before the verdict is announced. It is a solidly good book, bearing evidence of the greatest care and of the bestowal of enormous labour in the preparation of its pages. The freshness and unity of the first edition of this book are conspicuous, and, an important point in a work of this sort, a due discrimination has been held in what to allow, and what to deny, admission, of the interminable number of things possible to be said concerning drugs. The wise aim has obviously been followed of cutting out all trivial facts, or those wholly irrelevant to the needs of the druggist or physician. In this way dreary wastes of paragraphs to be waded through in the search for some vital point are avoided, and all important points stand out in bold relief. A feature that we decidedly regret, however, is the absence of references to authorities, especially noticeable in the descriptions of the physiological and therapeutic relations of drugs. Here we have the field, among medical topics, most noted for the *drawn battles* waged thereon, and where, therefore, a bibliography is of unusual practical value to the student. And if in a Dispensatory, which should be encyclopaedic in character, such a bibliography does not appear, whither shall the puzzled seeker turn?

By the physician, the paragraphs on therapeutics will probably be those first and most eagerly consulted; in a medical journal, therefore, these need particular attention at the hands of the reviewer. The plan adopted in dealing with this topic is thus exactly described in the preface: "In treating of therapeutics, the most trustworthy results of clinical experience are concisely set forth, without discussing the grounds on which they rest. This method has proved laborious, and has often required a prolonged judicial examination to arrive at a conclusion expressed in a few lines. Its object has been to spare the reader the labour of a personal investigation, which could only be made with facilities which comparatively few possess." Such a plan has—as all must have—both its advantages and disadvantages. By its means the student is saved the usual wearisome wade through clipped items taken helter-skelter from irresponsible writers; but, on the other hand, he has to accept, willy-nilly, the judicial decision of another mind than his own. As a judge, Prof. Stillé, in his decisions, shows great care and conscientiousness in the getting and weighing of evidence, but his "personal equation," to borrow an expressive astronomical term, is characterized by an intense skepticism towards everything new—as marked as the opposite blind faith of Ringer. In most instances, these warning notes of incredulity, coming from one of Prof. Stillé's eminence, will work good in checking that eager rush for novelties, which seems as natural a tendency among physicians as with the rest of human kind. But in some cases, if one has the right to sit in judgment on a judge, the skepticism certainly seems unwarrantable. And one feels the more right to criticize, since judgments are sometimes entered where no personal trial of the drug in question has been made by the arbiter. Thus in a recent published lecture,¹ Prof. Stillé, speaking of the use of preparations of salicylic acid in acute rheumatism, says: "I confess that I possess no personal knowledge of their use in this disease," adding, *postea*, "I have not, thus far, been tempted to employ it." And so, without personal trial, our author, in his judicial capacity, awards the prize for the best remedy in articular rheumatism to sodic bicarbonate, as against the claims of the salicylate. More astonishing even is the daring which sums up the "medical action and uses" of *sulphate of cinchonidia* in the brief sentence, "they have not been determined by experiment or clinical observation." Do,

¹ Medical Record, New York, Jan. 18, 1879.

then, the labours of the British Indian Commission go for naught? And are the enormous present sales of this salt compatible with entire lack of "clinical observation"? Other instances of the same determined disbelief are the sweeping and utter condemnation of the use, as such, of cardiac depressants like aconite or American hellebore—the doubt of any efficacy of phosphorus in neuralgia—and the omission of all mention of the antiseptic use of quinia. At the same time, curiously contrasted with this turning of the cold shoulder towards the new, is an occasional clinging to ancient therapeutic notions now commonly thought to be error; as where we are told that perhaps, after all, a probably inert preparation of conium may determine the dissipation of a cancer, or the resolution of a hyperplasia of the liver.

But enough of fault-finding. No one that lives can sit as judge in therapeutics without thereby setting himself up as a mark for some one's poisoned shaft. And so, having sent off the sharpest arrow in our quiver, we will frankly confess that the rest, if shot, would probably be bewitched into boomerangs by the magic of our target, and return to bruise the hand of the sender. Prof. Stillé has worn the ermine in the therapeutic court too long to be lightly impeached, and if exceptions to his decisions be taken, where shall we look for a higher Court of Appeals?

As a whole, the "National Dispensatory" not only makes good its right to exist, but proves itself a work which no progressive physician or pharmacist will dare to be without. It is handsomely gotten up, and is remarkably free from typographical errors.

E. C.

ART. XXII.—*The Croonian Lectures on Certain Points connected with Diabetes.* Delivered at the Royal College of Physicians. By F. W. PAVY, M.D., F.R.S. 8vo. pp. viii., 126. London: J. & A. Churchill, 1878.

THE views which Dr. Pavy holds, as expressed in this his latest communication, concerning the physiological relations of the liver to the normal appropriation of sugar, and its share in the production of diabetes, differ so slightly from those with which the profession has so long been familiar, that their statement here, further than is essential to the correct appreciation of the new arguments which he has advanced in their support, may be dispensed with. He maintains that the liver, instead of being a sugar-forming, is essentially a sugar-assimilating organ. In a condition of health, he holds that the amyloid substance of the liver is never converted into sugar; but in deviations from the state of health, sugar, in more or less quantity, does reach the circulation, and, as a consequence, appears in the urine in corresponding quantity; and that when the assimilative action of the liver is properly exerted, so little sugar is allowed to pass into the general circulation, as to be insufficient for rendering the urine more appreciably saccharine than is observed in general health; but when its assimilative function is not properly exerted, ingested sugar is allowed to pass, and in proportion as it does so the urine acquires a more or less saccharine character. It is seen, then, that the constant presence of sugar in normal urine is assumed as an axiom by Dr. Pavy, as a corollary from which follows his doctrine that the difference in elimination of sugar between the diabetic and healthy individual is merely a difference of degree, the sugar in both instances representing the unconsumed residue of ingested sugar, or sugar factors. Although Dr. Pavy lays great stress on the value which this assumption possesses in the support of his views, we cannot, however, see that he has produced any fresh arguments in its support, or has

settled the differences between Kühne, Seegen, and others. For while perhaps justly questioning the results obtained by the ordinary application of Trommer's, or the fermentation test, his results of the examination of *three* specimens of healthy (?) urine simply demonstrate the superior delicacy of Brücke's lead process, while no note having been taken of the dietetic condition of the individual, or of the persistence of the sugar, we cannot accept, as demonstrated from so few and imperfect observations, the statement that sugar is invariably a normal constituent of healthy urine.

The vital point of difference between the views of Dr. Pavy and those taught by Bernard, concerning the nature of diabetes and glycogenesis, is that while Bernard maintained the idea of an ingress of sugar, on the one hand, into the general circulation from alimentation and hepatic formation, and its destruction, on the other hand, in the peripheral capillaries, and, the balance being destroyed, that diabetes is due to an increased formation of sugar, Pavy denies all sources of sugar, except that directly ingested, and holds that diabetes is due to a decreased destruction.

In support of these convictions Dr. Pavy here alludes as conclusive, to his earlier observations as to the *post-mortem* production of sugar by the liver; but his experiments are so well known, and his conclusions therefrom so generally mistrusted, from the positive experiments of Flint, Dalton, Lusk, etc., that it is not needful here to discuss them, simply alluding to the fact that the demonstration of a *post-mortem* production of sugar by the liver does not prevent the conception of the *ante-mortem* exertion of that function; and is, in fact, only in accordance with what is observed in other organs—as, for example, the conversion of zymogen into trypsin, and the *post-mortem* development of the amylolytic ferment in a pancreas, from which all that ferment existing at the moment of death had already been extracted; and the statement that the portal blood contains as much sugar as the blood of the hepatic vein, is vitiated by the omission of a ligature to the portal vein before removal of the liver; as otherwise, the portal and hepatic veins, having no valves, the blood is not prevented from regurgitating into the portal (Brunton). It is also worthy of notice that Dr. Pavy still allows the existence of "a trace" of sugar in livers placed in a position to "prevent a *post-mortem* production of sugar."

We cannot therefore admit, with Dr. Pavy, that the glycogenic function of the liver is simply a *post-mortem* process; and even were there stronger arguments in its favour than have yet been adduced, we should hesitate in adopting the conclusion that when a substance like glucose invariably appears in an animal tissue after death, and even in tissues removed before death, with such rapidity that the interval is to be counted by seconds (*three seconds*), that substance was not there before death (Dalton).

We can, however, coincide with Dr. Pavy's criticism of Bernard's latest method of analysis. The point which Dr. Pavy makes, is that in Bernard's process (which depends upon the fact that in an organic fluid containing sugar, the sub-oxide of copper can be prevented from precipitation by the employment of a sufficient quantity of concentrated potash solution, the effect being a simple decoloration of the fluid); "the potash and the organic matter lead to the development of a reducing substance, which, without the presence of sugar, produces a decoloration of the test." In other words, he claims that Bernard's quantitative analyses of fluids supposed to contain sugar have really been analyses of fluids which contain no sugar at all, and have been estimations of some third quantity; an assertion which seems to be substantiated by Dr. Pavy's experiment, in which, in a fluid prepared from dog's blood in which the trace of sugar that was originally present had been destroyed by boiling with caustic-

potash, and which subsequently gave no reaction with Trommer's test, when treated by Bernard's process gave the result which Bernard had stated to be characteristic of the presence of sugar. Pavy explains this result as due, not directly to the organic matter to which the suspension of the sub-oxide has been attributed, but to the ammonia of which it is a source, while the reduction of the copper is due to some unknown factor.

Bernard's later analyses of the amount of sugar in the liver at the moment of death, are also discussed, and here again, with great justness, he takes exception to Bernard's process, claiming that the insertion of 20 gms. of liver into only 60 gms. of boiling water, cannot immediately coagulate all the sugar-producing ferment which is known to exist in the liver, or in the blood as others would have it. The effect must be to temporarily reduce the temperature of the water, and so favour the condition which the experiment is designed to prevent. It is to be remarked, however, that even by Pavy's accepted method he still obtains a trace of sugar.

In studying the normal amount of sugar in healthy blood, Dr. Pavy employs his own gravimetric method of estimating the quantities of sugar, by weighing the amount of reduced copper deposited by galvanic action on a platinum cylinder. He prefers to collect the blood at the moment of death of the animal, but before it can be influenced by the *post-mortem* action of the liver, as then, the perturbing influences necessary in the operation are avoided. Consequently, if Dr. Dalton's results are due to *post-mortem* action of the liver, the blood must be collected and examined in less than three seconds. His examinations of blood conducted in this manner, revealed the presence of sugar in the proportion of from 0.787 to 0.521 per 1000 parts, in opposition to from 1 to 3 parts per 1000, as stated by Bernard; while his examination of the liver when *post-mortem* change is prevented, revealed from 0.056 to 0.597 parts per 1000, in opposition to 1 to 3 parts per 1000, as claimed by Bernard.

Deferring for a moment any comment on these results, let us examine his observation as to the destruction of sugar in the circulation.

To answer the theory of its destruction in the systemic capillaries, comparative analyses are made of the venous and arterial blood, and he states that even if there should be found more sugar in the arteries than in the veins, there need not necessarily be invoked the *destruction* in the capillaries, as the loss may have been due to mere osmosis. He also directs attention to the fallacy apt to complicate results, in which the blood was not drawn simultaneously from artery and vein, and thinks this may explain the discrepancy between his results and Bernard's. Though it seems that his method of first killing the animal, and then "drawing a scalpel across the artery and vein determined upon, without any attempt at isolation," leaves a great deal to be desired as regards precision and reliability as to the exclusive source of the blood, and that, too, in experiments which are expected to show how errors from carelessness are to be avoided. Even in these we notice a slightly higher average in favour of arterial blood—arterial .8475, venous .8347, leaving an excess for arterial blood of .013—while his experiments relating to blood drawn in life show 0.003; results which he states are so small, the excess being first on one side and then on the other, as to permit of their being attributed to deficiencies of the method.

When we notice, however, that no note is made of the nutritive condition of the animals experimented upon, the amount of glycogen in the liver or in the muscles, and when we remember that the muscles have the power of taking up sugar from the blood, and converting it into glycogen (Weiss), of forming sugar again from this glycogen, and of changing both the sugar they form and the greater part of that which they receive from the blood into lactic acid and glycerine which

undergo combustion, and when we remember that Ludwig and Generisch have demonstrated a reduction of sugar in blood which passes through *contracting* muscles, the observations of Dr. Pavy are not of much importance, particularly as in experiments the muscles were at rest, and it is known that muscles at rest receive comparatively little arterial blood. And then clinically it has been shown that muscular exertion will diminish the amount of sugar excreted in diabetes. (Senator.)

His conclusions, however, are that there is only a small amount of sugar in the blood, there is constantly a small amount in the urine, and any difference between the amount of sugar in arterial and venous blood is too small to be considered of any significance.

In fact, he says that no evidence of destruction of sugar in the economy has been furnished, and he holds that "corresponding with the amount of sugar in the circulation there is elimination with the urine, and therefore whatever accumulation occurs becomes revealed by the condition of urine;" and he attaches great significance to the fact that, even with the slight amount of sugar found in the blood, there is a constant escape by the urine. That the quantity of sugar in urine is an indication of the condition of the blood is further supported by a table in which their relative proportions are shown, but certainly some explanation should be given of the fact that, although he has claimed that the blood in all localities presents an equal proportion of sugar, the proportion of sugar in the urine should be more than twenty times greater than that of the blood. If this relation is as fixed and definite as Dr. Pavy claims, we would expect that the condition of the blood would also indicate the condition of the urine, as he has expressly declared "that, corresponding with the amount of sugar existing in the circulation, there is elimination with the urine;" and we would, therefore, expect that in those animals whose blood was shown to contain about 0·5 parts per 1000, their urine should have contained 10.0 parts per 1000. We doubt, however, if such was the case; and if we are mistaken then the animals were diabetic, and should not have been used in conducting investigations as to physiological conditions. The observation as to diffusion of sugar has here, of course, no force, and in fact was created to explain the fact that sugar may be introduced into the circulation without appearing in the urine.

As regards the materials which go to form glycogen, Dr. Pavy is in accord with most observers, and we also notice that he states when "sugar is voided upon a strictly animal diet, . . . such sugar may be put down as taking origin from the abnormal descent of the amyloid substance derived from nitrogenous matter." He, however, persistently declares, from the considerations above alluded to, that it never, except under unnatural condition, passes into sugar, but, he thinks, gives origin to fat, although the only evidence that can be adduced as to such transformation is that the carbo-hydrates, from most of which glycogen can be produced, lead in some way or other to the accumulation of fat in the body. "but no one has yet been able even to suggest the way in which glycogen could be converted into fat." (Foster.)

These, then, are his opinions as to the physiological relations of sugar to the organism, and he next takes up its pathological relations in the production of diabetes.

Believing it demonstrated that the quantity of sugar in the urine is directly dependent upon the quantity of sugar circulating in the blood in both health and disease (this normal minute quantity being derived from that absorbed by the thoracic duct), and that normally all the sugar and glycogen factors injected in the food become converted in the liver into amyloid substance, which in its turn never normally becomes sugar, but is destined to form fat, he holds that diabetes

must be due to some condition which mainly prevents the conversion of sugar into amyloid substance, and secondarily favours the transformation of the latter into sugar, although he subsequently states that he inclines to the opinion that diabetes results simply "from the simple passage of sugar through the liver." A theory, however, which is rendered untenable by the fact that Grobe has found glycogen, though in small quantities, in the liver of a diabetic; and it has been found that the excretion of sugar can be increased by the administration of glycerine, a substance which forms sugar only after having been converted into glycogen in the liver. So, too, when the sugar puncture is performed in an animal in which the formation of glycogen has been prevented by arsenic, glycosuria is not produced.

The production of diabetes, however, he believes to be dependent upon an excess of arterial blood in the portal circulation, and details in its support an experiment in which the injection of defibrinated arterial blood into the portal vein was followed by marked glycosuria, while a similar procedure with venous blood had no effect. Although this explanation seems to account satisfactorily for the production of diabetes from nervous lesions, that is, as far as the undoubted concurrence of diabetes and disturbance of the abdominal circulation, in support of which he makes the extravagant statement that the redness of the tongue in diabetes may be considered as an index of the over-arterialized condition of the portal blood, it hardly seems that such a marked perversion of glandular action could follow a mere increase in its supply of oxygenated blood—that we could have an entire suspension of its normal function and its direct contrary established. We might imagine, as would accord with the theory of glycogenesis, that an increased arterial supply might cause an increased functional activity, but hardly the conditions accepted by Dr. Pavy. But, besides, Dr. Pavy has himself brought forward facts which increase the difficulty attending the acceptance of his views, such as the ligature of the vena porta, by which, of course, an excess of arterial blood was not created, and yet there was an increase of sugar in the blood with an ingenious explanation as to why it did not appear in the urine; and then, if we are to infer from the context that in this condition the liver received arterial blood alone (hepatic artery), and hence diabetes, we would expect that section of the vaso-motor nerve accompanying these vessels, by which the arterial blood-supply would be increased, would be followed by diabetes. Dr. Pavy's earlier observations, however, have proved this not to be the case.

But then Dr. Pavy has also shown that an excess of venous blood in the liver, as in asphyxia, may be productive of diabetes. This condition of affairs, which he believes is only *apparently* inconsistent with his views as to the arterial production of diabetes, is explained by the increased pressure to which the hepatic cells are subjected by the venous engorgement causing "more or less transudation and direct admixture of their contents with the blood," and the production of diabetes in a manner analogous to that caused by the direct injection of glycogen into a vein. If this is the correct explanation, why does not the injection of venous blood into the portal vein, by which a local venous plethora is produced, cause diabetes?

The production of glycosuria by carbonic oxide is explained by the similarity of action on the hemoglobin possessed by this gas and oxygen.

Going back now to the physiological condition, he states that the reason the glycogen accumulates in the liver is on account of its peculiar venous supply, and offers this condition as an explanation of the development of sugar and absence of glycogen in the early months of foetal life, when the arterial supply to the liver is very great, and the venous supply comparatively insignificant, while in later months the portal circulation acquires more importance, and hence the conver-

sion of glycogen into sugar is stopped, and glycogen is then to be found in the liver. He also states that the conditions in which glycogen accumulates in other localities is in favour of his view, as in muscles at rest, in hibernation, and in solidified lungs in pneumonia. In other words, glycogen tends to accumulate in certain structures under the existence of a limited supply of oxygen; when more oxygen is supplied it is converted into sugar. It does not seem, however, that this explanation is any more satisfactory than that of Brunton, who attributes the storing of glycogen in such localities to the rapid cell growth there taking place.

Finally, we must take exception as to the manner proposed by Dr. Pavy in which lesions of the nervous system produce diabetes, viz., by causing "the presence of oxygenated blood in the portal vein." For it has been pointed out by many observers, more especially Cyon, that after such lesion it is the circulation in the hepatic artery that is modified while the portal circulation is apparently not affected, while vaso-motor paralysis of the intestine, which he considers "constitutes the key to the explanation of the saccharine condition of the urine in diabetes" when artificially produced, as by section of the splanchnic nerves, not only does not cause diabetes, but even prevents its production by the sugar puncture; the explanation of this fact by Cyon not being adequate to account for its production under Pavy's theory. Besides, it should not be forgotten that the vascular dilatation might be quite a secondary and non-essential phenomenon, as in following out the simile drawn by Dr. Pavy in the case of the salivary glands, the secretion of saliva following stimulation of the chorda is not necessarily due to the consequent vascular paralysis, as the vascular dilatation may be produced, as in atropia poisoning, by stimulation of the chorda without any secretion; and on the other hand secretion may be produced by the same stimulation, even in the absence of the circulation.

In conclusion, we can see no grounds in the arguments here adduced by Dr. Pavy for discarding the opinion that the glycogen of the liver is a reserve fund of carbo-hydrate material to be converted into sugar as the needs of the system require. While diabetes from the passage of ingested sugar unchanged through the liver, if it occur at all, is only one of many ways in which the disease may be produced (see the admirable lectures of Lauder Brunton on Pathology of Diabetes, in *Brit. Med. Journ.* 1874), we cannot consider that Dr. Pavy has proved that the normal function of glycogenesis is due to the presence of venous blood in the portal vein, and the morbid condition of diabetes is due to super-oxygenated portal blood.

R. M. S.

ART. XXIII.—*Lectures on Dermatology; delivered in the Royal College of Surgeons of England in 1876–1877–1878. Including Derangements of the Colour of the Skin; together with Affections of the Nails, Hair System, and Cutaneous Gland System.* By ERASMUS WILSON, F.R.S., etc. 8vo. pp. 286. London: J. & A. Churchill, 1878.

THE present volume concludes the nine courses of lectures delivered by Mr. Wilson on the foundation established by himself in 1869. It is possible also that it marks the conclusion of dermatological teaching from that chair, since we learn that the scope of the endowment is to be enlarged "to embrace original work in every department of surgical pathology." There is, therefore, a certain, almost pathetic, interest in these lectures, since not only is it unlikely that Mr. Wilson will hereafter publish any other work, but the lectures themselves, now concluded,

mark the close of an epoch. For years Mr. Wilson has been the acknowledged leader of British Dermatology. His works, studied by physicians in all English-speaking countries, and translated into foreign languages, have served until within the last few years as one of the chief sources of enlightenment upon the subject of which they treat. But, either the isolation in which Mr. Wilson as a specialist must for many years have lived, or a certain independence of character, fostered in its relation to his dermatological views by an immense clinical experience, has placed him in a position quite different in many respects from that occupied by his fellow dermatologists the world over. In two points particularly is this difference marked: In the nomenclature of skin diseases, and in the pathology of the parasitic affections. Mr. Wilson has added many new names to dermatology, and has frequently renamed familiar affections, and changed the names of well-known diseases, to the great perplexity of students making their first acquaintance with skin diseases through his works, or comparing them with the teachings of others. To recall an instance: some years since Mr. Wilson conceived the idea that ordinary psoriasis is the degenerate and effete progeny of leprosy. Forthwith psoriasis received the name of *lepra*, and patients suffering from this mild and comparatively curable disease have been nearly driven frantic with the idea that they were affected with elephantiasis Graecorum, or true leprosy. The present writer had at one time under his notice a woman whose life had been embittered for years through the announcement on the part of her medical attendant that she was the victim of true leprosy; the fact being that she had suffered from a scaly eruption closely resembling psoriasis—the *lepra* of Wilson.

Many years ago Mr. Wilson made up his mind that there was no such thing as a parasitic skin disease, and he "has since seen no reason to change his views," notwithstanding that *all* other dermatologists, American, English, German, and French, unite in ascribing a fungous origin to a large class of skin affections. Mr. Wilson thus appears in the slightly absurd position of one who having once made up his mind defies mankind to move him.

These peculiar notions lead to some extraordinary statements on the part of Mr. Wilson in treating of the various diseases. Thus, under the head of "derangements of colour of the skin," we find the affection known as *tinea versicolor*, which is generally maintained to be a parasitic disease, described as "essentially an affection of the follicles of the skin, accompanied with a varied amount of congestion of their capillaries, and by a disturbance of nutrition of the epithelium of the follicle and adjoining epidermis." Under the head of *tinea capitis* or ring-worm, this disease is defined as "essentially an inflammation of the follicles of the hair; in a word, a *folliculitis*." *Favus* is "marked by a phytiform degeneration of the cell-tissue of the epidermis and its cognate structure the epithelium." While the clinical description of the favus crust is minute and extensive, no mention is made of the microscopic appearance of the crust, further than the above allusion. Again, in summing up his views upon the character of these affections, *tinea*, *favus* and *versicolor*, Mr. Wilson reiterates his opinion that "the phytiform structure is developed where it is found, that it is independent of any organisms existing exteriorly to the skin, and that it is incapable of transmission by contact or inoculation." In speaking of *sycosis*, Mr. Wilson appears to be completely in the dark as to the diagnostic signs which separate the parasitic and the non-parasitic varieties. He does not of course admit the existence of any parasite in the disease, although he appears to be fully aware of the existence of two forms which he calls respectively *mentagra* and *sycosis*. In attempting to describe these, Mr. Wilson is not clear, and is even especially muddling in places, as indeed could hardly fail in the endeavour to prove the identity of dissimilar and distinct affections.

It has seemed necessary, in examining a work like the present, to speak of these matters in some detail because they occupy the main part of the volume. But there are other points which may be touched upon with more pleasure, and among these is the description of the various diseases of the hair. Mr. Wilson's enormous experience has stored his mind with an abundance of illustrative material which he uses with very good effect, and the sections which treat upon the subjects of "excessive hairiness," "baldness," and "grayness," are among the most instructive and agreeable in the book. Even here, however, we are constantly annoyed at the brevity and imperfection of certain interesting clinical histories personal to the author, and also by the absence of any reference to date and place in speaking of the work of others.

To the specialist Mr. Wilson's books are of advantage, but for the general practitioner or the student they are not to be recommended. We know of no surer method of bewildering and wearying the student of dermatology, and of perplexing him and leading him astray than can be afforded by a careful perusal of the brilliant series of works written by Mr. Erasmus Wilson. A. V. H.

ART. XXIV.—*Papers on the Female Perineum, etc.* By J. MATTHEWS DUNCAN, A.M., M.D., LL.D., F.R.S.E., Obstetric Physician to St. Bartholomew's Hospital. Small 8vo. pp. 156. London: J. & A. Churchill, 1879.

THIS is one of the exhaustive monographs, based upon personal observations, for which Dr. Duncan has become famous as a writer and contributor. Unwilling to regard the teachings of our fathers as necessarily correct and well established, he has, by careful investigations, upturned in several instances opinions which proved to have been founded rather upon faith than facts. In this book we find that he has been at the same kind of work, in regard to the frequency of ruptures of the perineum, vulva, and vagina in natural parturition; embodying in it several special articles that have appeared over his name during the last three years, and making of the whole a very complete treatise. The main points under investigation are the following, viz., Laceration of the vaginal orifice inevitable in primiparae; description; cause of; Stellate and circular lacerations; Frequency of central rupture; Cracks of perineum; Vestibular lacerations; Supporting perineum and effect of forceps; Lacerations in multiparae; Partial and complete central rupture; Laceration of recto-vaginal septum; Fistula from central rupture; Post-partum sloughing of perineum and recto-vaginal septum; Relations of foetal head to rupture; Foetal heads in primiparae and multiparae compared; Procidentia of pelvic viscera.

A few words from the first page of the work show how different have the results of Dr. Duncan's observations been, from what has so often been taught in obstetrical text-books: "The orifice of the vagina I believe to be invariably injured in the natural labour of a primipara. At least, I have never seen it otherwise. The perineum, or its anterior edge, the fourchette, or in other words, the posterior margin of the vulvar orifice, frequently escapes laceration, as the sequel will show."

Dr. Duncan believes that the orifice of the vagina is generally the undilating and resisting point, and not the perineum; and says of such cases, "I have often delivered without any injury of the perineum resulting, though certainly not without any injury of the orifice of the vagina."

"It is quite common to hear assertions of the complete absence of laceration in primiparae, but I have never been satisfied that in the cases referred to, a sufficiently careful examination has been made. To do it, one requires a good light, an assistant, and a sponge."

"The injuries that can be discovered in examining women after delivery are for the most part arranged around the vulvar opening in a stellate manner radiating from a centre. . . . Of the 89 injuries described in these reports of 25 cases, 83 were of this stellate character, or about 93 per cent."

"If a laceration is inevitable, treatment to prevent it can be of no avail. But all the lacerations of the vagina are not inevitable, and that one which is so, may be treated with a view to prevent its extension beyond the inevitable degree." . . . "The accoucheur can prevent the precipitate expulsion of the child, and its attendant evils." p. 17-18.

Dr. Duncan, in opposition to the teachings of Leishman, and Graily Hewitt, is very decidedly in favour of supporting the perineum, and thus securing a gradual dilatation of the endangered tissues.

The absence of pain and soreness in the woman is not to be taken as evidence of freedom from laceration. "In Case XII. the lacerations were numerous and very severe, the vulva having the appearance of being gashed in various directions, yet the woman declined to admit that she had any pain in the pudenda, and catheterism was frequently performed without any complaint being elicited."

"The injuries that can be discovered, . . . are for the most part arranged around the vulvar opening, . . . radiating from a centre," and are "like clean cuts, some more or less ragged on the edge. Others might be called deep abrasions, and have been designated ulcers." "Some were evidently the result of longitudinal or axial strain," and were "more or less circular, . . . that is, transverse to the direction of the strain." "Among the injuries described in the 25 cases, three cases, or about 12 per cent., belong to the central perineal category." "In one case, No. VI., there were 8 separate lacerations." "In several instances the vestibular and anterior lacerations were more extensive than the perineal and posterior, but the latter were generally the predominant injuries in their extent." "In 10 cases out of 25, the perineum escaped unhurt, the fourchette being entire. In only 9 cases out of 25 was the vestibule un torn."

We have given sufficient of the author's investigations to either induce the obstetrical reader to desire to possess the whole work; or to enter upon a series of personal observations by which he may satisfy his own mind as to the proportion of such injuries that occurs in his own practice. There are several questions left open by Dr. Duncan, which may be looked into, viz., Does resisting the perineal expansion, endanger vestibular rupture, or an increase over the common measure of it? Does the use of the short forceps increase the danger of vaginal laceration, and to what extent? What connection is there between the existence of vaginal cracks and abrasions, and the liability to septic infection, either from without or within? A series of parallel investigations, in assisted and unassisted cases, might be of some value in establishing the degree of utility of many obstetrical appliances believed to be for the benefit of the woman in curtailing the degree of her danger and suffering.

R. P. H.

ART. XXV.—*Health, and How to Promote it.* By RICHARD McSHERRY, M.D., Professor of Practice of Medicine, University of Maryland; President of Baltimore Academy of Medicine, etc. 24mo. pp. xi., 185. New York: D. Appleton & Co., 1879.

THIS little book aims to do for the individual and the family what has been so well done for the public, or for large bodies of men, by several distinguished authors. It speaks to the father and the mother rather than to health officers and military authorities. It is true that its scope is, to a great extent, included in that of the more general works; but the bulk and expense of the latter, with the fact that their teachings are not wholly comprehensible by unprofessional readers, render some such book as this very desirable.

An admirable analytical Table of Contents lays out with great clearness the ground to be gone over. The work is in two parts. The first, after showing that hygiene is the better part of medicine, proceeds to show in successive chapters the especial precautions adapted to preserve health during the different age-periods of twenty years each.

The chapter dealing with health-preservation from birth to twenty years is divided into sections partly referring to subdivisions of the time, as "Infant Life," "Childhood," and "Youth;" and partly to especially important influences which bear, or may bear, upon healthful development: as the "Intellectual and Moral Training," "Kindergarten," "The School-house," and "Physical Exercise." The observations, suggestions, and criticisms, in this chapter, are very just, and clearly expressed. There is little pretension to originality; indeed, prominent writers on health and education are very freely quoted. The remarks on intellectual and moral training, on light and varied tasks for the very young, against precocity in general, and in advocacy of systematic physical culture going hand in hand with study, are particularly good. The author sympathizes with the late Dr. Clarke in his views of coëducation of the sexes; and is also emphatic in his denunciation of the stupid and murderous construction of school-rooms. Correspondence with the authorities of the Naval Academy, and of the Virginia Medical Institute, bears testimony to the beneficial effect there noticed, on the health of lads, from the systematic drill, exercise, and general attention to bodily condition, which is closely mingled with mental training.

In the chapter upon the "Young Man and Young Woman," parents are strongly counselled never to encourage any aspirations after a life of ease and idleness. Health, of mind and body, is best promoted by regular and useful activity. No work, is as bad as, or worse than, overwork. An earnest plea is made for early marriage—(*i. e.*, by the time the age of twenty-five is reached.) In order to render such possible, he justly argues that boys and girls must be brought up with more modest and rational ideas as to dress, establishment, and luxuries, than are common in our day and land.

The chapters on "The Man," and "The Woman," and upon the "Declining or Old Man," are judicious; the latter especially is full of wise counsel and suggestion, very neatly expressed. In our country, above others, it is particularly rare to find men growing old gracefully. High pressure is maintained till the machinery breaks down, and the man passes from full manhood to dementia; or, more rarely, he abandons his laborious habits while yet in health, retires from business, and painfully endeavours to "enjoy" his wealth and leisure. Whether or not an early training of a different character might cause the latter course to be a success, we will not undertake to say; but as things are here and now, it

usually proves a sad failure—the man is lost, bored, restless, discontented beyond endurance.

Part Second of this little book is entitled "Hygienics in some Detail," and treats of the influences, habits, conditions, and surroundings which affect human health in general, and which are, to a greater or less extent, capable of control or modification by intelligent action.

Temperament, idiosyncrasy, heritage, habit, and constitution, are first viewed in their relations to hygienic effort. Professional readers scarcely need to be told the drift of this chapter. Much stress is laid upon the potency of inheritance, especially as affecting the health of children born from "intermarriage of disease"—consumptive men marrying cancerous women, etc.

In the chapter on the "Air we Breathe," very much importance is rightly attached to the purity of the atmosphere in bed-rooms, and in gas-lighted sitting-rooms occupied by families. The "bed-room smell" must be familiar to every one. The air of sitting-rooms not only becomes close and hot, and loaded with the products of combustion in gas-burners and in lungs, but, as is palpable to the sense of smell, also with effete organic particles. These latter, as is now pretty well understood, are by far the most important element in "crowd-poisoning." The amount of carbonic acid is very generally of comparatively little importance, save as it roughly measures the animal pollutions. We know a certain sitting-room in which, with an open fire, the air seems to a caller perfectly sweet and wholesome, but which—with the same occupants, same number of gas-jets, and all conditions identical, *except that the fire is omitted* on account of mild weather—becomes absolutely offensive from organic odours, to a visitor from the open air. The author's remark that the disuse of "Venetian shutters" is a great mistake, we heartily agree with. While excluding, when desired, the direct rays of the sun, they allow of windows being open, and they break the draught and diffuse the entering air as no curtain or hanging shade can do. Privacy is assured, too, by the first, while the latter secures that end only when the window is closed, to prevent the wind from displacing it.

Our writer attributes "cholera infantum" to foul air, rather than to improper food; but he seems to ignore entirely the direct effect of excessive heat.

Speaking of "malaria," in its restricted sense, as producing fever and ague, he says it may be generated by decaying vegetable matter in a cellar. We doubt whether this statement will be generally accepted as true. He accepts the theory, recently offered, that the "mountain fever" of the far West is malarious, and due to spores which, borne on the winds, are entangled in the nascent snow-flakes, and subsequently poured into the hill-side torrents.

The chapter on "Water" is well adapted to its purposes. We are glad to notice warnings against the use of excessively cold water, and in great quantities. It is really painful, while travelling by rail, to note the incessant and inordinate guzzling of ice-water by children. The consumption is obviously enormously above the requirements of a healthy thirst. We are not sure that the potency of this habit, for evil, is yet at all sufficiently appreciated. Parents should certainly discourage it, by precept and example.

Treating of clothing, we are glad to see the wearing of water-proof cloaks and shoes reprobated, except for a very short time. Of course, small waists, tight shoes, long trains, out-lying or semi-detached bonnets, come in for their well-deserved condemnation.

In his chapter on "Food," we cannot help wishing that our author had been a little more outspoken in explaining the inferiority, for nutriment, of the "refined flours," as compared with those which retain a large portion of the cortical substance of the wheat-grains. The proper growth of bones and of brain is too

important a matter not to be made a very prominent consideration in the choice of diet,—especially for children.

Practical hints on the principles of wholesome cookery, and directions for the choice of meats, are here not at all out of place, and may do much good. Under the heading, the “Manner of Eating,” the principles upon which deliberate eating is adjudged favourable to health are clearly stated. And another caution is well worth heeding—the amount of nutriment should be proportioned to the work or active exercise. As a rule, he says, the prosperous classes eat too much. We believe this to be especially true in this country.

Upon the alcohol question, Dr. McSherry holds common-sense views. Alcohol is a food (in certain diseased conditions, at least), a stimulant, or a narcotic, according as circumstances and doses vary. Without inquiring very closely whether alcohol is ever actually needed or beneficial to the healthy man, he believes that very moderate potations of light wines or beers may be safely taken with meals, and after labour. His limit is so much of these as shall contain, at most, two ounces of alcohol in 24 hours.

The effects of tobacco are considered in the same moderate temper. For lads and young students especially, he deems any indulgence extremely harmful, and cites, in confirmation, a report on the subject by a committee of three naval surgeons appointed to ascertain the facts as witnessed in the Naval Academy. Very many adults may safely smoke in moderation.

Having now glanced at the contents of Prof. McSherry’s book, we have a few words to say as to the manner in which its subjects are presented. There is little or no pretence of bringing forward any new light. The best ascertained principles of hygiene are set forth, very frequently, in frank quotations from eminent sanitarians, such as Richardson, Bowditch, Hufeland, and a score of others. The work might almost be termed a compilation. We do not by any means complain of this as a fault. There are, however, one or two points open to criticism; such extremely free use of Latin and French quotations, poetical and proverbial, as we find here, is surely a little objectionable in a book for popular use. A somewhat too obvious striving to be humorous, occasionally gives an appearance of flippancy to the discussion of important matters. True, it may be pleaded that some readers may be attracted by a light and airy manner. On the whole this little book seems to us very well adapted to its purpose, and will, we hope, have a wide circulation, when it cannot fail to do much good.

B. L. R.

ART. XXVI.—*On Deafness, Giddiness, and Noises in the Head.* By EDWARD WOAKES, M.D. Lond., Surgeon to the Ear Department of, and to, the Hospital for Diseases of the Throat and Chest. 8vo. pp. 143. London: H. K. Lewis, 1879.

THIS small work contains a large number of practical hints as to the physiological origin of the symptoms alluded to in the title. It is, therefore, a valuable guide in making a diagnosis in some of the most annoying cases the aurist meets, or his patients endure. It may be said that this book has as its chief object the explanation of numerous aural diseases by means of the reflex irritation conveyed to the organ of hearing from various irritated and relatively remote regions. Thus, ear complications in dentition, resulting often in fatal convulsions, are shown to be due to the irritation conveyed from the inflamed gums, through the inferior dental nerve, to the otic ganglion and thence to the nervi vasorum of the carotid plexus.

Since the latter nerves possess inhibitory power over the internal carotid artery, which sends a branch to the drum head (tympanal branch), the parts of the ear thus supplied by the carotid become gorged with blood when this inhibitory power is taken off. The effect in such a case is to "excite waves of vessel-dilatation in the correlated area." The vessels of the drum become distended; acute congestion is thus established with its attendant stretching of the sensitive and tense tissue in which it occurs, and so occasions the pain experienced by the subject of these conditions. If the irritation be sufficiently prolonged, effusion into the tissues ensues, which, under favourable circumstances, will pass on to suppuration and constitute a veritable otorrhœa. But before suppuration is fully established here, there is great danger of an extension of inflammation to the membranes of the brain. This the author shows to be due to certain structural arrangements at the petro-squamosal fissure. At this fissure, in the infant, the dura mater dips down into the tympanic cavity, becoming continuous with its mucopériosteal lining. This process of dura mater is richly endowed with vessels from the middle meningeal artery, which also supply the drum cavity. It becomes manifest, therefore, that congestion and inflammation of the drum cavity may be directly and rapidly conveyed to the meninges of the brain in infants. Towards adult life this fissure becomes more or less obliterated, though the vascular arterial connection exists. The author very justly states the obvious conclusion that "when brain symptoms develop themselves in an infant, it is to the *ear* that attention should be primarily directed."

In the treatment of such a case of ear disease from dentition, a comfortable posture should be secured for the infant. "This is best done by placing it on a large pillow across the knees of the nurse, who must be enjoined not to rock it, as every movement will aggravate the patient's suffering. The head may be raised somewhat by a small horse-hair cushion placed under it. The room should not be very light; it should be free from noise, and the temperature cool. The affected ear, which will usually correspond with that side on which the gums are most swollen, should be uppermost. It should be fed with a spoon, as the act of sucking increases the pain. Attention to these details will add greatly to the ease of the sufferer, and in proportion promote recovery." Of course the gums must be lanced, since by this operation, the waves of irritation proceeding from the gums to the ear are stopped, and the dilatation of the vessels subsides, if no trophic changes have occurred. This short sketch of the morbid processes in dentition will serve to show what the author means by reflex irritation.

Among important symptoms in an infant suffering from aural disease, is rolling of the head from side to side. This the author considers the counterpart of vertigo in later life, as in Ménière's disease, and would of course indicate that the disease had invaded the labyrinth, and, as the author believes, the semicircular canals. In older children affected with grave lesion of the internal ear, sobbing is set down as a symptom; and it is also said to occur as a constant symptom in adults affected with recognized labyrinthine disease.

In the chapter on ear diseases arising in the exanthemata in childhood, the author alludes to the necessity and importance of puncturing the drum-head. He shows, we think, that many deaths among children suffering from these diseases, and which are attributed to the "oppression of the sensorium due to the intensity of the blood-poison," are really due to lesions in the middle ear, and the extension of the morbid processes to the meninges of the brain, or to pyæmia, embolism, and thrombosis arising in the ear. The author bases his statements on an experience extending over four or five epidemics of scarlet fever, and the usual amount of measles, smallpox, etc.; and he shows that, from the commencement of an exanthem, the drum-head should be kept under observation, "just indeed as the

conjunctiva would be under similar circumstances." In many cases the application of a leech near the ear "will prevent future trouble;" in fact, may obviate the necessity for puncturing the drum-membrane.

We agree with the author in all he claims for the necessity and benefits of this operation, but we do not think well of the use of "his duck-bill-shaped instrument," which he introduces into the meatus and fastens there, to enable him to puncture the membrane. Such an instrument should not be introduced into an infant's ear, even if there seemed to be any need of it; and we may say there is no need for such an instrument in any case of paracentesis of the drum-head. It is a cumbersome instrument, and is in fact nothing more than Charrière's aural speculum, with everted lips at the smaller end. The latter feature is especially bad, since the sides of the instrument are more liable to press into the tender walls of the auditory canal, and give great pain when the speculum is opened.

The author stands alone among those considered as authorities, in his preference for the inferior quadrant in front of the malleus handle, for the position of the incision; and he is again open to criticism in the kind of knife he advises with which to puncture the membrane. Simplicity in all the instruments used about the ear is highly desirable, but this knife must be pushed by a thumb-spring, in order to use it. This would necessitate pressure against, as well as the cut into, the inflamed membrane. Furthermore, if the entire outside diameter of this instrument exceeds a millimetre, it cannot fail to darken the auditory canal when passed down it, and hence the operator would find it highly inconvenient. Some such experience may have led our author to devise his duck-bill-shaped instrument to widen the canal. But, as we have already said, this is out of the question, if the ear is to be manipulated without pain to the patient. After the perforation is made, however, by any means, we have never found it necessary to endeavour even to wash out the tympanic cavity and the mastoid cells with a solution of bicarbonate of soda, as recommended by Dr. Woakes, for two reasons: first, because with a free opening in the membrana tympani, matter will escape fast enough not to take away too much pressure from the atonic vessels in the drum; and secondly, regarding the mastoid cells in infancy, it may be said that they are so small or so meagrely developed as not to demand the attention they require in adult life.

We regret that in a book, where there is so much of value in the etiology of disease, there is so much to criticize unfavourably in the treatment of aural diseases generally. But this we suspect is due to unfamiliarity with aural works, the author having advanced to his aural studies through a predilection for the investigation of nervous phenomena generally. Were this not so, he would not claim, at least by implication, the invention of his "duck-bill-shaped instrument," nor of his "pneumatic retractor," both of which are well known to aurists as at least very old in principle and application. And at least one of the author's theories is open to the same criticism; we mean his views regarding the objective nature of tinnitus, in opposition to the usually received idea that tinnitus is a subjective state. It is doubtless due to morbid vibrations in the bloodvessels, *i. e.*, true sound-vibrations in the ear, as very graphically shown by Dr. Theobald, of Baltimore, in 1875.

The third chapter, "on Ear-Cough, and Laryngeal Complications dependent on Ear Disease," is one of great interest, and contains a successful explanation of the above-named phenomena. Ear-cough is shown to be due to "irritation of the sensitive fibres of the auriculo-pneumogastricus distributed in the meatus, which is reflected along the motor fibres of the superior laryngeal nerve, exciting in the larynx the act of coughing, by causing contraction of the crico-thyroid muscles," etc. If this irritation is kept up, functional derangement may become

structural lesion, by involvement of the vaso-motor fibres associated with the auricular branch of the pneumogastric nerve. They conduct the irritation to the pneumogastric ganglion, and from this subcentre it is deflected to the first cervical ganglion. This latter furnishes the nervi molles to the external carotid artery and its branches, and, therefore, to the vessels of the mucous membrane of the larynx. By impressions conveyed over this nervous tract, congestion of the vessels of the larynx ensues, and effusion or hypersecretion in this organ takes place.

In the fourth chapter, Giddiness, and the connection between Stomachic and Labyrinthine Vertigo, is explained. Our author has already rendered our readers familiar with his views on these subjects through an article which he published in the number of this Journal for April, 1878, and of which this chapter is a reprint.

The fifth chapter is devoted to a consideration of the Etiology, Diagnosis, and Treatment of Noises in the Head, *i. e.*, of tinnitus aurium. Here the vertebral artery, and its connection with the lower cervical ganglion, are adduced very successfully to explain the tinnitus due to morbid circulation in the labyrinth. Pulsating noises are explained as the result of a dilatation of the internal auditory artery. Whenever the pulsation is undefined, or associated with buzzing and singing in the head, the author treats the case with hydrobromic acid, since Dr. Fothergill has suggested that this drug antagonizes the symptoms of cinchonism, which the aural disease in question resembles. The dose employed has been 15 minimis in water every four hours.

The author then alludes to tinnitus which occurs in anaemia, aneurism of the aorta, intercranial aneurism, by which is meant, we suppose, *intra-cranial* aneurism, and in an overloaded condition of the portal circulation. *Inter-labyrinthine* is used for *intra-labyrinthine* on p. 89, and on p. 85 the tensor tympani is spoken of as the "extensor muscle;" but doubtless these will be corrected in a future edition. The treatment recommended for the nares, as well as that proposed for the Eustachian tube (p. 102 and p. 117), we cannot regard with favour, as it seems hazardous.

We agree with the author in his opinion that nitrite of amyl is not as potent to quell tinnitus aurium as has been claimed. The book before us must be considered a great and decided addition to the etiology of some of the most obscure aural symptoms, but we regret that, on the other hand, the surgical treatment is, as a rule, one that we must dissent from, as being liable to irritate rather than soothe an organ, which the author presupposes to be in a condition of reflex-irritation. As a guide in the diagnosis of some forms of aural disease, however, we regard the work as indispensable.

C. H. B.

ART. XXVII.—*Cyclopædia of the Practice of Medicine.* Edited by Dr. H.

VON ZIEMSSEN, Professor of Clinical Medicine, Munich, Bavaria. ALBERT H. BUCK, M.D., of New York, Editor of American Edition.

Vol. XIII. Diseases of the Spinal Cord and Medulla Oblongata. By Prof. WILHELM HEINRICH ERB, of Heidelberg, Baden. 8vo. pp. xii., 975.

Vol. XVII. General Anomalies of Nutrition and Poisons. By Prof. H. IMMERMANN, of Basel; Prof. R. BOEHM, of Dorpat; Prof. B. NAUNYN, of Koenigsberg; and Prof. H. VON BOECK, of Munich. 8vo. pp. xiv., 968, etc. etc. New York: William Wood & Co., 1878.

PROF. ERB, the sole author of Volume XIII., does not need a formal introduction to our readers, as a brief sketch of his life and work appeared in the

number of this Journal with the notice of Volume XI., on Diseases of the Peripheral Cerebro-spinal Nerves, the preparation of which was also entirely entrusted to him. The subject of the present volume is one of great interest to physicians, for perhaps no branch of pathology has recently made as rapid advances as that embracing diseases of the spinal cord and medulla oblongata. In the course of little more than twenty years, through the labours of Romberg and Duchenne, we have learned to distinguish locomotor ataxia from other forms of spinal disease, while our knowledge of multiple sclerosis and of sclerosis of the lateral columns is much more recent. Charcot's description of multiple sclerosis is so admirable and so true to nature that other observers have been able to add little or nothing to it. The author, however, proposes a different explanation of the volitional tremor, which is one of the characteristic symptoms of the disease. It is well known that Charcot attributed it to the relatively long persistence of the axis-cylinders in the sclerotic nodules, because, in his opinion, the impulse of the will would be conducted through the naked axis-cylinders only in a sort of jerking manner. Prof. Erb, on the contrary, thinks it is much more likely to be due to the involvement of certain parts of the brain in the disease. With a special view to the decision of this question he has recently examined twenty-two cases of this disease. In all of them, which had presented the tremor during life, he found sclerotic patches in the pons, medulla oblongata, and pedunculi, as well as in other portions of the brain and spinal cord; while in the few cases in which tremor was absent during life, although nodules existed elsewhere in the brain, there were either none at all or at most small ones in these portions of the brain or in the cerebellum. Ebstein has also reported a case in which the spinal cord was alone diseased, and in which during life there had been ataxia, but no tremor. On the other hand, in a case observed by Kelp, which belonged to the purely cerebral form, the tremor was present. Hammond and Orlenstein are also of the opinion that tremor is absent in the purely spinal cases.

The author's remarks on the treatment of this disease are few. They show, however, that his results have not been more favourable than those obtained by other observers. Nitrate of silver has proved useful in some cases, but unfortunately its effects are only temporary. In one case the cold water treatment was followed by improvement, and in another the subcutaneous injection of arsenic seemed of service. In this last case the patient was benefited at a later period by the galvanic current. On the other hand, he has seen nothing but harm come from the use of warm baths, chloride of gold, phosphate of zinc, belladonna, strychnia, ergot, and bromide of potassium.

In an argument which want of space alone prevents us from reproducing in full, Prof. Erb shows conclusively that the ataxic symptoms of locomotor ataxia, or, as he prefers to call the disease, *tabes dorsalis*, cannot be referred exclusively, if at all, to disturbance of sensibility. In fact they bear no proportion in degree to the intensity of the latter, severe ataxia being often observed where there is little or no impairment of sensation, and, on the contrary, being entirely absent even in cases of complete spinal anaesthesia, as in the case reported by Schueppel and Spaeth. He concludes, therefore, that the ataxia in tabes can by no means be the effect of the derangement of sensation which may happen to coexist, but that it must rather depend upon a disturbance of co-ordinatory tracts lying within the spinal cord, and that it is therefore a motor ataxia. While the possession of sensibility is indispensable to enable us to acquire the faculty of making co-ordinate movements, it is not necessary that it should be retained in order that we should continue to perform those acts which have already been learned.

The author is not able, however, to tell us where to look for these co-ordinating

tracts. They can scarcely lie in the posterior columns, for these have been found extensively diseased in cases in which ataxia has not been present. They are situated more probably, he thinks, in the lateral columns.

The reader will find among other subjects fully discussed in this admirable volume, that of the tendon reflexes, which was brought to our notice only a year or two ago by Westphal. If in health a tendon is struck, and especially the ligament of the patella, an immediate contraction of its muscle takes place. This effect is very much diminished in some diseases of the spinal cord, as, for instance, locomotor ataxia, and increased in others, as, for example, sclerosis of the lateral columns. The contraction of the muscle is, under these circumstances, the author claims, a true reflex action, and not produced, as asserted by others, by the direct action of the blow upon the muscles. It is often seen in diseases where no reflex action is produced by irritation of the skin, and its importance in a diagnostic point of view cannot well be overrated. A very similar symptom, and occurring in disease generally under the same circumstances as the preceding, is the tremor of the foot and leg, which is produced by suddenly flexing the foot, and to which Westphal has given the name of "ankle clonus."

In addition to the articles in this volume, which we have thus briefly noticed, we wish to call special attention to the general remarks on the physiology and anatomy of the spinal cord, and to those on the symptomatology and etiology of its diseases.

The writers for Volume XVII. are more numerous, but are less well known, none of them having, we believe, with the exception of Immermann, contributed articles to any of the preceding volumes of the work. This gentleman appears in the present volume as the author of the chapter on "General Anomalies of Nutrition," under which head hæmophilia, scurvy, and purpura hæmorrhagica are described. In his article on the first of these conditions he very fully recognizes the value of the contributions made to its literature by some of the early American physicians, including Drs. Otto, Smith,¹ and Hay, the existence of which had almost escaped from the memory of our own people, until recalled a few years ago by Dr. R. P. Harris, in a notice of Dr. Wickham Legg's book on this disease in the *Philadelphia Medical Times*. The author shows from statistics that the disease occurs more frequently in certain countries than in others. Thus in Germany it seems to be exceptionally common; next to Germany in the order of frequency comes Great Britain, followed by the northern countries, Sweden, Norway, and Denmark; then North America, Holland, Belgium, Switzerland, Russia, and Poland. But few cases have been reported from France, and none from Italy, Spain, Portugal, Greece, and Turkey. A remarkable predisposition seems to exist also in the widespread Jewish race, since the disease has been repeatedly noticed among this people in connection with the rite of circumcision, while of the total number of bleeder families, thus far reported, a considerable proportion have been among Israelites. The prevalence is, therefore, little influenced by climatic differences, and the same remark will apply also to the elevations of the regions affected; cases being reported from the lowlands of Holland as well as from the high Alpine valleys of Switzerland. Dr. Immermann refers very fully to the well-known fact that while the males of the bleeder families suffer in much larger proportion than the females from the active form of the disease, the latter are very much more likely to transmit the disease to their offspring. He attempts,

¹ In a note the translator refers to a letter written by Dr. E. H. Smith, of New York, in 1794, to Dr. Rush, of the same city. Dr. Brayton Hall, of New York, the translator of this article, probably is ignorant of the fact that Dr. Rush was wholly identified with Philadelphia, but it is difficult to understand how the American editor should have allowed such an error to pass uncorrected.

in the section on Pathogenesis, to explain the immunity which they enjoy in a way which, we think, will hardly be generally accepted.

Some writers have asserted that the blood in patients suffering from this disease is deficient in the red-corpuses and fibrin, but this is, in the author's opinion, a mistake dependent upon the fact that the blood examined is generally obtained during the latter stages of the hemorrhage, when it has undergone the typical changes belonging to acute anaemia. The blood at the outset of hemorrhage is, he says, not paler in colour than in healthy persons. It maintains its coagulability also for a long time during the hemorrhage, and does not acquire the above-mentioned watery quality until late in the attack. So far from being wanting in red blood-corpuses and fibrin, it actually contains an unusually large amount of these elements; and is, moreover, characterized by a comparative poverty in leucocytes.

The author also attaches very little importance to the existence of anomalies in the position of the cutaneous and subcutaneous vessels, consisting in an unusually superficial course of the same, upon which some observers have laid so much stress. In addition to this, structural changes in the arteries, such as a striking delicacy of their walls, and an abnormal narrowness of their lumina, have also been pointed out. But the presence of these changes, as well as of hypertrophy of the heart, has by no means been proved in all cases, and even where they undeniably exist he regards them as subordinate to another factor in the disease. This he holds to be "the habitual existence of a high degree of absolute plethora," to which sufferers from this disease are liable. In support of this opinion he adduces the following facts: 1, the peculiar congestive symptoms which so frequently precede by a shorter or longer interval the spontaneous bleeding in these individuals, and which may very reasonably be interpreted as a sign of vascular engorgement; 2, the surprising toleration of excessive losses of blood; and, 3, the equally remarkable, complete, and rapid restitution of the volume of blood. Of course, in cases where the vessels are thin and superficial, a moderate amount of plethora will be sufficient to excite the bleedings, a result which will be still more likely to take place, if hypertrophy of the left ventricle of the heart, as is not unusual, be found to coexist.

We have already referred briefly to the fact that Immermann attempts to explain the immunity from the active forms of this disease, which the women of bleeder families as a rule enjoy, while retaining the power of transmitting the diathesis to their male offspring. There is nothing unreasonable, he says, in the supposition that the maternal predominates over the paternal influence in the development of the vessels and blood in view of the known relations of the so-called parablastic tissue to the maternal organism. It will generally be admitted also that the disposition to plethora is stronger in the male sex—a condition which he believes is further prevented in the female by the periodical occurrence of the menses, which act, he says, is a very effective derivative, preventing overfilling of the vascular apparatus, and the formation of a congestive diathesis. But will this hypothesis—for it is nothing more—ingenious as it is, serve to explain the almost constant escape from fatal hemorrhage of the women of bleeder families during the act of parturition? For it must be remembered that pregnancy is not only frequently attended by plethora, but also puts a stop to what the author calls "a very effective derivative." Perhaps he has felt this difficulty as well as ourselves, for he does not allude to the effect produced by child-bearing upon this class of women.

Holding the views he does of the pathology of haemophilia, it is not extraordinary that Immermann discountenances the use of iron except in the condition of anaemia which follows a copious hemorrhage. With Legg, he holds that it is better not to check a spontaneous hemorrhage too soon, considering it a relief to

the plethora, but recommends ergot and acetate of lead, together with rest, in controlling it when it becomes excessive. He expresses the belief, however, that the only way to eradicate the malady from a community is to prevent by law the marriage of the women of bleeder families, as they are alone likely to transmit the disease to their children. It will thus be seen that the author's conclusions in regard to the disease do not differ materially from those already reached by Dr. Legg.

We had intended, before closing, to refer briefly to a few of the chapters on "Poisons," but unfortunately this notice has already outgrown the limits assigned to it, and we have therefore only room to say that we have found those we have read both interesting and instructive.

J. H. H.

ART. XXVIII.—*Transactions of the Obstetrical Society of London.* Vol. XX.
For the Year 1878. Pp. 346. London: Longman, Green & Co., 1879.

THIS is quite a small volume compared with some of its predecessors, and abstracts of several of its articles have already appeared in this Journal. We shall therefore present but a short notice of it, and only call attention to those articles which have not been already laid before our readers.

Dr. CHAMBERS reports a case of extirpation of the uterus and ovaries for the removal of a fibro-myoma, the whole mass weighing 14 pounds. The patient was single, æt. 36, and had had good health up to five years before the operation. There was but little hemorrhage. She gradually sank, and died in 26 hours. Wound healthy; no peritonitis; no flatus in the bowels; no fluid in abdomen; no hemorrhage. A small portion of the elongated and adherent fundus of the bladder had been included with the ligature, and cut off in the removal of the uterus.

Mr. LAWSON TAIT reported two remarkable cases of the repair of the female bladder and urethra after vesico-vaginal fistulæ, the result of extensive sloughing, in one of which the opening had existed for fifteen years. In the first woman the amount of urine retained was at first but half an ounce, but this gradually increased to four ounces. In the second case, the one of fifteen years' standing, the bladder gradually expanded so as to hold an ounce, then several, and finally up to nine ounces. The principle upon which Mr. Tait operated is said to be original with him, and a great step in advance of former expedients, enabling cures to be produced in cases formerly regarded as beyond remedy.

The plan adopted by the operator will be understood by a few extracts from his paper. He says of the first case: "My idea was that if I could make anything in the shape of a tube out of the cicatricial tissue in the vaginal wall, I might then, by releasing the ridge at each side, bring it and the uterus down, and by folding the remains of the bladder upon itself, and fastening it to the new tube, I might at least make a receptacle for a small quantity of urine." The first attempt failed. In the second, he made his incisions longer and wider apart, as follows: "I made two almost parallel incisions an inch and a half apart, and rather more than an inch long, running in the axis of the symphysis pubis and equidistant from it. With the aid of my staphylorrhaphy raspatories I lifted up two flaps consisting of everything I could raise from the bone, and again united them in the middle." The parts were not examined for two months, at the end of which time "I found that a canal three-quarters of an inch in length, and sufficient in diameter to allow a No. 6 catheter, had been formed." The stitches

were removed, and, after a few days, the second step of the operation was performed as follows:—

"I first of all made a raw surface at each side of the ridge at its upper end, this surface having a crescentic form, and extending over one-fourth of the circumference of the passage on either side. I then made a deep incision at each end of the tense ridge at the upper part of the vagina, cutting until I felt the whole mass, including the uterus, move when I drew upon it." "I then pared the edge of the ridge, and fastened it down to the raw surface by passing sutures wherever I could find any tissue to hold them. I left, however, one corner, the right one of the square flap, unattached, so that at this point there was free exit for the urine."

All the parts united; and the third step of the operation closed the provisional orifice at a later date, the whole of the proceedings covering a period of four months. The bladder began by degrees to retain a little water, and finally the woman was enabled to keep dry from half an hour to three hours, never wetting her bed at night.

The urethral restoration of the second case was the same. The narrow part of the fistula was closed, by drawing and stitching the parts together, and the wide, after two trials, by wedge-shaped side flaps from the vagina. As there was less destruction of bladder, the viseus had eventually a much larger capacity than in the former case.

Dr. J. BRAXTON HICKS reports another fatal case of *Cæsarean operation* in a woman in her ninth month of utero-gestation, who was affected with cancer of the rectum involving the vagina. The uterine wound was closed with eight silk sutures, which were all found to have been torn out after her death, which resulted in 24 hours, from prostration, slight peritonitis, and the escape of fluids into the peritoneal cavity. The child lived, and was doing well when six months old.

Dr. DUNCAN C. McCALLUM, of Montreal, describes the case of *conjoined twins*, "*Marie-Rosa Drouin*," who were born in St. Benoit, Canada, Feb. 28, 1878, and who, it will be remembered, were exhibited in Philadelphia last October, when 7 months old. They differ from the Ohio twins, also shown here, in the fact that they are united at an obtuse angle instead of in a straight line, and the double leg opposite the pair of legs is a very small appendage.

Dr. AVELING, in an article on *the curves of midwifery forceps*, gives the credit of having invented the pelvic curve to Mr. Benjamin Pugh, of Chelmsford, Essex, England, who, in a work on Midwifery, in 1754, states that he contrived it fourteen years before, or in 1740. Mr. Pugh, it is also claimed, was the first to apply the forceps above the superior strait.

Dr. JOHN WILLIAMS, in a paper on *changes in the uterus resulting from gestation*, drew attention to the wrinkled condition of the lining membrane of the uterine arteries after involution following delivery, as an evidence of the former existence of pregnancy in suspected subjects. Dr. W. found this condition to exist as long as fifteen years after the last pregnancy, in a patient of 55, who had ceased to menstruate for eight years, and whose uterus had undergone senile atrophy. He had never seen it brought about by disease, or observed it in the virgin organ. The corrugation is believed to be due to an imperfect restoration of the arterial calibre after great distension and hypertrophic enlargement, the vessels being made small, but not smoothly contracted.

Dr. GEORGE ROPER reported the existence of a variety of *anteflexion of the uterus*, which originates in the foetus, and does not depend upon any pathological changes in the uterine tissues. In these cases the sound is introduced with difficulty, and the organ may be straightened, but will resume its curve by its own elasticity, as soon as the instrument is withdrawn. Dysmenorrhœa and sterility are common attendants of the condition, for the removal of which various schemes

have been advised, Dr. Roper recommending the gradual dilatation of the parts affected, by means of metallic sounds.

Dr. WYNN WILLIAMS preferred to rely upon the insertion of the vulcanite stem, supported on an India-rubber shield, the latter being made of thin rubber stretched across a small modified Hodge pessary, and perforated with holes. He had treated between sixty and seventy cases of anteflexion at the Samaritan Hospital during the last two years, nearly all in this way, without untoward result. "He frequently received letters stating that women had become pregnant after the insertion of the stem and shield."

In a long discussion that followed the reading of Dr. Roper's paper, we find how diverse are the opinions of the profession upon the safety and usefulness of the stem pessary. As the theory upon which the instrument was devised appears to be a correct one, it is to be regretted that it has so often led to dangerous if not fatal results. The non-metallic flexible stems, based upon yielding supports, all of India-rubber, appear to offer the greatest measure of safety, although nothing is absolutely safe that is inserted into the uterus.

R. P. H.

ART. XXIX.—*Handbook of Diagnosis and Treatment of Diseases of the Throat and Nasal Cavities.* By CARL SEILER, M.D., Lecturer on Laryngoscopy at the University of Pennsylvania; Chief of the Throat Dispensary at the University Hospital; Curator of the Pathological Society, etc. etc. 12mo. pp 156. Philadelphia: Henry C. Lea, 1879.

THE author of this work disclaims in his preface the intention of writing a book based upon theory, and says that "only points of practical importance have been discussed," and declares that in carrying out this purpose he trusts his book "may be used as a ready book of reference on the subjects of which it treats."

In order to accomplish his objects, he has taken up one-third the space allotted to his entire work in the description of the laryngoscope, the art of laryngoscopy, the laryngeal and rhinoscopic images, etc. etc. In nearly all of these details he agrees with the many classical authors who have written on the subject. In some points of this part of the author's work, in which he separates himself from other writers, we cannot agree with his stated experience. For example, on page 16, he finds the spectacle frame of Semeleder "insecure" and "tiresome;" and for the inspection of the posterior nares (p. 37) "the larger the mirror that can be borne by the patient, the better can the cavity be illuminated."

In the chapter devoted to the instruments accessory to laryngoscopy, etc., he gratuitously affirms that most remedies employed as applications to the mucous membrane of the throat and nasal cavities are used in solution. In our daily practice, as well as in that of many well-known specialists, powders are actually much more frequently used than solutions. In fact we have come to regard their curative properties as more valuable and freer from objections.

The author uses the term "traumatic" on many occasions, and usually, as we believe, incorrectly. It is scarcely proper, it seems to us, to say that inflammations caused by the inhalation of irritant vapors (p. 51) are *traumatic*, or that acute laryngitis, if *traumatic*, may be caused by the inhalation of dust (p. 58).

In advising the use of nitrate of silver as an inhalation from the atomizer, we would like some mention to be made in regard to the utility of a face protector. Again, it is an error to affirm that local applications of solid nitrate of silver to chronically inflamed tonsils are used with doubtful results, for we know of no

more efficient remedy when fused upon an aluminium probe and introduced deeply into the lœunæ of these organs.

The description of acute laryngitis is too concise to be thorough; and, inasmuch as important symptoms, such as stridulous respiration, etc., are not even mentioned, we cannot believe that accurate diagnosis will be aided in great measure by its perusal.

We might go on to the end and find many faults in this little work, which would be far better if sins of *commission* and *omission* were remedied. We do not wish to be severe, but really of what use is such a work? In Reynolds's *System of Medicine* we have quite as good a compendium of the diagnosis and treatment of throat diseases; and in the work of Browne, or Cohen, there is everything and more than is here put down. If special treatises must be written now-a-days in great abundance, let them at least contain novel investigations or plausible theories on debated questions. Let them have here and there a few illustrations which come from the author's own storehouse. The work before us has no special merit other than that it is small and of moderate price. It contains only what is already familiarly known. It errs by making the statement of facts so brief as to omit essential ones; and whenever the beaten track is left, the author's convictions are not narrated in such a way as to require more than very moderate commendation.

B. R.

ART. XXX.—*Hygiene of Sight.*

1. *Die Schulhygiene auf der Pariser Weltausstellung, 1878.* Beurtheilt von HERMANN COHN, Dr. med. et philos. a. o. Professor der Augenheilkunde an der Universität zu Breslau. Mit 2 Tafeln Abbildungen. Breslau. Verlag von E. Morgenstern, 1879.
- School Hygiene at the Paris Exhibition of 1878. Critically examined by HERMANN COHN, M.D. et Ph.D., Extraordinary Professor of Ophthalmology at the University of Breslau.
2. *School Life in its Influence on Sight and Figure.* Two Lectures by R. LIEBREICH, Consulting Ophthalmic Surgeon to St. Thomas's Hospital. London: J. & A. Churchill, 1878.

THE alarming increase of myopia, and especially its prevalence among young people of both sexes in city schools, must have caused many observant biologists to speculate as to the exact mechanism by which the unfavourable influences of our present civilization were at work, so as to bring about this rapid deterioration of the visual organs in the last few generations of mankind. These observations of Prof. Cohn, in conjunction with his previous investigations, have done much to explain and point out the means of avoiding this serious degeneration of our most important sense, and the less original lectures of R. Liebreich have been useful in bringing the subject before the English public. Little attention has, however, been paid to the matter in America, and we therefore propose to give our readers a somewhat extended notice of the conclusions to which these two high authorities have arrived.

In a previous essay presented before the Ophthalmological Congress of Heidelberg, in 1865, Prof. Cohn reports that among 10,060 students and pupils of all classes, he found 1004 myopes. All the schools in which he made his investigations included some near-sighted individuals, but in the village schools these unfortunates were found in the proportion of only 1.4 per cent., whilst in city schools 11.4 in every hundred were affected with myopia. Furthermore, in the

primary city schools the proportion was 6.7 per cent. In schools of the second grade, myopes were met with in the proportion of 10.5 per cent. In normal schools the percentage rose to 19.7; and in the Gymnasia, or highest schools, to 26.2. In the first class of the Gymnasia *more than half* the pupils were myopic.

From the researches of our author, with those of Erisman (of St. Petersburg), and others, it seems indubitable that the work of reading and writing brings about lamentable development of myopia.

It is certain that myopia is hereditary, and that, according to the great law of the extinction of the unfit, the children of myopic parents are predisposed to the development of this disease, so that they will certainly suffer from it, if exposed to conditions which would be apt to engender near-sightedness in normal eyes quite free from any taint of hereditary tendency. We are, therefore, as a people threatened with an infinite increase of myopia, unless preventive medicine can devise some efficient sanitary precautions for counteracting the injurious effects of prolonged application in the school-room upon our visual organs.

Among the general deductions reached by Cohn and others the following are the most important:—

In the first place study-rooms should be well lighted during the day, and especially toward evening, because a feeble or badly arranged light compels us to diminish the distance between the eye and the book whilst reading or writing.

Light should be allowed to enter from the left side. Illumination from the front is more or less dazzling, and obliges the pupils to bend forward too much, or to sit side-wise in constrained and fatiguing positions. Again, light coming from behind is entirely insufficient, because in great measure cut off' by the head or upper part of the body of each scholar.

The windows of a school-room should be large and high, be arranged along the left side of the apartment so as to shed the light upon desks placed in rows at right angles to the wall in which they are cut.

The light from above furnished by a skylight is not so good as that derived from lateral illumination. The light of lamps is recommended as being preferable to gas, and the gas light shining through ground glass globes is condemned as particularly objectionable.

The inclination of the desk at which the pupil sits to read or write is a matter of no small importance. Desks which are horizontal, or only slightly inclined, favor the development of myopia by compelling the scholar to bend the head over a good deal whilst reading or writing. Such a position brings on, as a mere result of weight of the blood, passive congestion of the head and eyes, and this results in an intra-ocular tension, insensible perhaps when it first appears, but very marked in its effects when long and constantly continued. Besides, a child who acquires the habit of leaning forward in this manner, is very apt to bend nearer and nearer his book as the muscles of the back become fatigued, and thus, by straining his power of accommodation at short focus, promote the rapid development of myopia. The desks of school children should, therefore, be sharply inclined at an angle of 40° or 45° when used for reading, and their seats should not be too high, and should be furnished with comfortable backs.

Great care should be taken to secure school books well printed in large, clear type; since those printed in small, indistinct letters, upon bad paper, with poor ink, as in the case with too many of the classics and the dictionaries in common use, necessitate a close approximation of the eyes to the page, and consequently exaggerated efforts at accommodation favouring myopia.

Furthermore, all punishments of school children which consist in depriving

them of recreation or exercise out of doors, or in adding to their amount of study, and consequent employment of the visual apparatus, should be relinquished.

Dr. Cohn gives us some valuable comments upon the various models of school-houses, furniture, etc., displayed in the French Exposition, quoting from the Architect's (Stanislas Ferrand) pamphlet upon cheap model school-houses, as follows:—

"We draw near now to the time when the most *spiritual* people upon earth are seriously undertaking to learn to read and write, and by this means raise themselves, through the modern extension of public liberty, to the rank of civilized nations, respecting whom an illustrious citizen has said: 'The people which has the best schools, is the first people; if it is not so to-day, it will be so to-morrow.'"

Visitors to the Exposition, and especially those of us who were fortunate enough to enjoy the aid of the admirable plans and guides to objects of hygienic interest, furnished to its members by the Congrès International d'Hygiène, will doubtless recall the pretty little school-house near the southern corner of the Champ de Mars, close to the Avenue de la Motte-Piquet. To this model of economical efficiency, our author devotes over seven pages of description, and generally approving comment, although he considers the ingenious system of ventilation adopted by Ferrand as unnecessary, complicated, and expensive.

The plans and models of school-houses displayed by other countries, are also carefully noted, but much less fully described. In regard to the United States, Nos. 15 and 16 upon Dr. Cohn's list, we find the following:—

"In a special room of the American section, is found the collective exhibition in regard to national education. Here, among innumerable books and charts, stands the large model of an elementary school in Washington, furnished with a great many windows, the proportion of which, to the superficial area of the room, could not, however, be calculated.

"The same may be said of a second very large model of the Indiana State Normal School, at Terre Haute, supplied with numerous Gothic windows, but with the floor space of the class-rooms uncertain."

Dr. Cohn declares that a school-room cannot be too well illuminated, and, on page 12, recommends what seems to us the exaggerated proportion of 1 square foot of window area to each square foot of floor space. In any case he maintains the window area should be at least 30 square inches to every square foot of floor surface.

The remainder of our author's essay is chiefly taken up with a minute description of the school furniture, especially desks and seats, exhibited by most of the civilized nations of the world. The minor differences of these could, however, with difficulty be appreciated without the aid of the numerous outline drawings supplied in Cohn's second plate, and we must therefore refer our readers to the brochure itself for these latter details.

The general principles which must be kept in view in the construction of seats and desks for school children, are deduced from the investigations of Cohn, Erisman, Fahrner and others; and are accessible to those who are not familiar with French and German, in Liebreich's lectures. According to this observer, the faults of school furniture, which give rise to injurious postures, and so conduce to myopia and asthenopia, as well as to scoliosis or lateral curvature of the spine, are:—

- “1. Want of, or unsuitable backs.
- “2. Too great a distance between the seat and the desk.
- “3. Disproportion; generally too great a difference between the height of the seat and that of the desk.
- “4. Wrong form and slope of the desk.”

Liebreich gives a very clear exposition of the way in which these defects cause the diseases already mentioned, and concludes with the subjoined recommendations, which he considers, however, less advantageous than what he calls the American plan of having the seat and desk made to every child's measure; or the Swiss system, when seven or more different sizes of seats and desks are manufactured to suit the different classes:—

“ 1. One and the same size and model of desk should be used for children and grown-up persons of both sexes.

“ 2. The adaptation to the height of each child should be effected by varying the height of the seat and the foot-board.

“ 3. The edge of the table is always to be in a perpendicular line above that of the seat.

“ 4. No seat is to be without a back, and the top of this is always to be 1 inch lower than the edges of the table for boys, and 1 inch higher than the edge of the table for girls.

“ 5. In all classes where the boys change places, the height of the seat is to be regulated in proportion to the average height of the pupils.

“ 6. In all girls' schools, in all those boys' schools where the children do not change places, in boarding schools, and in private school-rooms, the seat of each child should be accurately regulated in proportion to its height.”

The support for the back should incline only a few degrees from the perpendicular, and be so arranged as to press upon the spinal column just above the hips of the pupil. The breadth of the seat ought to be considerable, in order to support most of the thighs, and its height just such as to allow the feet to rest easily upon the foot-board. The desk should be so arranged, by means of a hinged flap or otherwise, as to hold the book at an angle of 40° or 45° whilst reading, and the paper at an angle of 20° whilst writing is being performed by the scholars.

J. G. R.

ART. XXXI.—*Demonstrations of Anatomy; being a Guide to the Knowledge of the Human Body by Dissection.* By GEORGE VINER ELLIS, Emeritus Professor of Anatomy in University College, London. From the eighth and revised English edition. 8vo. pp. 716. Philadelphia: Henry C. Lea, 1879.

THIS book is intended for use in the dissecting room, and is designed to aid the student while at work with scalpel and forceps. Accordingly the different regions are discussed in such a manner that the muscles, vessels, and nerves are described, as found in each situation, without following out their distant distribution. This method is, obviously, well adapted to the end for which it is designed. A serious omission, however, is the absence of any description of the bones of the part. It is proper enough to begin with the superficial structures and gradually descend to the various layers of muscles, the vessels, nerves, and ligaments; but why neglect to touch osteology, upon a correct appreciation of which the knowledge of myology, etc., must depend? It may be said that the student should know the characteristic markings and processes pertaining to the skeleton, but the fact remains that he does not; and, moreover, those who teach practical anatomy will sustain the assertion that many a student begins to dissect who has never even handled more than one or two human bones. After he has finished his part he may be taken to the skeleton, when it is more than probable that he will have no adequate idea of the attachments of the muscles which he has just seen. A few wood-cuts of the bones, and a short description of them, would be a valuable addition to the volume. Another objection is the fact that the illus-

trations are small and the structures represented by them referred to by figures and foot notes, which is a method far inferior to printing the names directly upon the part, as is now done so frequently in such text-books as those of Holden and Gray. A manifest improvement, however, is the repetition of cuts where the text speaks of parts that have been previously represented, but not described. This avoids the inconvenience of turning back to hunt an illustration many pages distant. Examples of this arrangement are seen in figures 2 and 9, 1 and 6. Other excellent features are the tables of the arteries, veins, and nerves of the region, which are added at the ends of some of the chapters, and serve as a recapitulation.

The author has very properly devoted several pages to the delineation of the cerebral convolutions and fissures, which, at the present time, should be included in all anatomical treatises, since the study of cerebral localization has received so much attention. The dissection of a number of brains some years ago, when Ecker's little book on the convolutions appeared, showed the reviewer that the surface topography of the brain was sufficiently constant to deserve notice in our ordinary anatomical rooms, though usually but little attention is paid to it. The chapters on the special senses are well worth careful attention on the part of the student.

The volume before us must be recognized as a good guide for the anatomical room, but a perfect dissector's manual has not yet been published. Some experience as a teacher of practical anatomy has shown the present writer that there is need of a book, of six or seven hundred pages, which shall contain large wood-cuts, with the name of each part printed upon it, as is done in Gray's *Anatomy*, and a concise description of the bones, muscles, vessels, and nerves. The systematic treatises on anatomy are too large for convenience, and too detailed to render the main facts sufficiently prominent. Such a work would doubtless command a ready sale, but until something of this kind is furnished us, we must feel the value of such works as that just reviewed.

J. B. R.

ART. XXXII.—Recent Works on Skin Diseases.

Epitome of Skin Diseases, with Formulae, for Students and Practitioners.

By TILBURY FOX, M.D., etc., and T. C. FOX, M.B., etc. Second American edition, enlarged and revised by the authors. 12mo. pp. 216. Philadelphia: Henry C. Lea, 1879.

Notes on the Treatment of Skin Diseases. By ROBERT LIVEING, A.M., M.D. Cantab., etc. Fourth edition, revised and enlarged. 12mo. pp. 130. New York: William Wood & Co., 1878.

THESE two little volumes may properly be considered in connection, since their general aim and scope are the same. The present edition of Dr. Fox's book shows decided improvement over the first edition published in this country three years ago. While the volume is only a little larger than before, it contains three times as much matter. In fact it is rapidly assuming the rank of a treatise. The section on pathology has been recast, and this, together with the remarks upon methods of examination in diseases of the skin, forms the most satisfactory part of the book. Dr. Fox's classification cannot be entirely commended, and it is especially confusing when compared with the order in which the various diseases are described, an order, like that followed by Dr. Liveing, purely alphabetical. This confusion is somewhat increased by the interpolation, on the part of the American editor, of a third system of classification, that adopted by

the American Dermatological Association. There is much to commend, however, in this little work, and especially the careful revision of the text, bringing it up to the present state of our knowledge, and, what is unusual, giving credit to American dermatologists for work done. The full cutaneous pharmacopœia which this book, like Dr. Liveing's, contains as an appendix, remains almost without change as in the first edition, and the inquiring dermatological tyro can "stick in his thumb, and pull out a plum" almost wherever he pleases—if he only knows just which plum he wants.

Dr. Liveing's book has reached its fourth edition, and thus appears to enjoy popularity among those who appreciate the class of works of which it is a good example. The description of the various diseases is brief, but as clear as is possible in a limited space, and the treatment suggested is fully up to date. But when we come to classification and arrangement there is confusion. After giving a modification of Hebra's classification, Dr. Liveing passes on to discuss the different affections in *alphabetical* order. This is fatal to the attempt at obtaining a distinct idea of the relations of the diseases to each other. A further examination shows such statements as the following: "Prurigo, in most cases (at least in this country) is due to pediculi." "The sudden healing of open discharging sores is sometimes attended with unpleasant consequences." This is not the teaching of the dermatology of the present day, and it is a pity these obsolete notions should continue to be propagated among the profession at large.

A. V. H.

ART. XXXIII.—*Ophthalmic Out-patient Practice.* By CHARLES HIGGINS, F.R.C.S., Ophthalmic Asst. Surgeon Guy's Hospital, Lecturer on Ophthalmoscopy Guy's Hospital Medical School. Second Edition. 8vo. pp. 116. Philadelphia : Lindsay & Blakiston, 1879.

THIS little book seems designed to convey such general and elementary knowledge as would be given to a class of students in attendance upon the "clinics" of an ophthalmic dispensary.

In glancing at the table of contents we were, at first, unfavourably impressed with such headings of sections as "Discharge from the Eyes," "Intolerance of Light," and "Watering of the Eye;" but were agreeably disappointed to find diseases of the conjunctiva, of the cornea, and of the lachrymal apparatus treated very clearly and with admirable conciseness. We still object, however, to this use of prominent symptoms, and think that its inconsistency is shown by the fact that the first symptom mentioned under the head of "Iritis" is "some watering of the eye," and the admission that in "Interstitial Keratitis" "intolerance of light is rather a variable symptom."

An immense amount of misery has resulted from the failure, too often on the part of even experienced practitioners, to recognize *iritis* and *glaucoma*. The chapter on these diseases is excellent, and, in some ten short pages, contains practical information enough to prevent any one who reads it and remembers it from making this grave mistake. The "busy practitioner," who has not the time or the inclination to study more extended accounts of these diseases, would not do amiss to get this one by heart.

In regard to treatment, the familiar picture that the author has given us of the routine of practice at Guy's differs but little from that of the "out-patient" departments of ophthalmic hospitals in this country. To a few points of difference, however, it may be well to call attention. Iodide of potash, which is not men-

tioned by the author in this connection, is generally relied upon in the treatment of *interstitial keratitis*; and we doubt if many would agree with him in the use of leeches in *suppurative keratitis*. The effect of eserine in diminishing the tension of the ball is pretty well established, and it is considered a valuable remedy in *glaucoma*, particularly in doubtful cases in which immediate operation might hardly be justified. In lachrymal obstruction we would not expect the benefit that the author seems to claim, from merely slitting up the canaliculus, except in the rather rare cases in which the obstruction is seated in this part of the lachrymal apparatus; and the advice that "In any case—even if no improvement take place—we should abstain from further operative interference for five or six weeks" is not in accordance with our practice. In a large proportion of cases, this would merely subject the patient to unnecessary delay and loss of time.

The directions for determining and treating the anomalies of *refraction and accommodation* are much too brief to serve as reliable guides in practice, but a good general idea of the subject may be obtained from them.

In the chapter on the *ophthalmoscope*, the normal appearances and pathological changes most frequently met with in the fundus of the eye are well described.

We have rarely seen so much important information condensed in so short a space as may be found in the "Ophthalmic Out-patient Practice," and medical men who have not the opportunity to observe that kind of practice for themselves will find here a remarkably clear and concise account of it. G. C. H.

ART. XXXIV.—*On Diseases of the Abdomen, comprising those of the Stomach, and other parts of the Alimentary Canal, Æsophagus, Cæcum, Intestines, and Peritoneum.* By S. O. HABERSHON, M.D., London, Sen. Phys. to, and late Lecturer on the Principles and Practice of Medicine at Guy's Hospital, etc. With illustrations. Second American from the third enlarged and revised English edition. 8vo. pp. xv., 554. Philadelphia: Henry C. Lea, 1879.

THIS edition of Dr. Habershon's well-known work has been augmented by additional chapters on Diseases of the Tongue and Mouth, Diseases of the Pharynx, Peritonitis, Ascites, and Abdominal Tumours, and the number of illustrative cases has been increased from 163 to 192. As the first edition received an extended notice in the columns of this Journal for January, 1860, it is only requisite to refer to the changes which have been suggested by an additional experience of some twenty years.

The new chapter, on Diseases of the Tongue and Mouth, is a fragmentary summary, and offers nothing for special observation save some allusions to acute œdema of the tonsils, which we do not comprehend. The advice that the sooner an abscess in the tonsil is opened, the better, accords with our own observations, though objected to by many as imprudent and unnecessary; and mention is made in this connection that a protruding abscess may sometimes be opened by the pressure of a sharp finger-nail.

Chapter III., on Diseases of the Pharynx, is likewise a new one, and, while including a variety of subjects, is so carelessly phrased and paragraphed as to be somewhat confusing. Thus, the treatment of secondary syphilitic ulcerations of the throat, and the pathological anatomy and symptoms of ulceration in serofulvous and tuberculous subjects, are all cursorily mentioned in the same paragraph (p. 50). There is also a slight mention of diphtheria, the greater portion of which is given up to the paralytic sequelæ; and our author expresses his opinion

that diphtheria is essentially distinct from croup, in pathological character as well as in clinical history.

The chapter on Diseases of the Oesophagus, has been much enlarged and improved, and is quite systematic. It contains a great deal of valuable clinical material, illustrated by the records of thirty-one cases, comprising ulceration, perforation, functional dysphagia, spasm, syphilitic stricture, carcinoma—including a table of 74 cases, aneurism of the aorta, poisoning by deglutition of caustic substances, and rupture; and there is likewise a table of seventeen cases of gastrotomy for stricture, carcinoma, and malignant tumour, the longest prolongation of life having been forty days, and the next longest thirteen days.

In commenting upon the difficulty of determining the character of ulceration of the oesophagus, and the unsatisfactory character of its treatment, the remark is made: "It is painful to find, after death, that simple ulceration of the oesophagus, or a fistulous communication with the trachea, is the only existing disease; and that if food could have been introduced beyond this point, life might have been prolonged," and the serious consideration is suggested of the propriety of forming a gastric fistula in some of these cases (p. 59). In discussing the diagnosis of stricture, auscultation of the oesophagus is alluded to, but in terms leading to the inference that it has not been submitted to personal test. Extreme caution is urged in the use of bougies in the treatment of cancerous disease, though their serviceability is acknowledged at times, as a means of facilitating the introduction of nourishment into the stomach. The importance of resting the parts is illustrated by a very instructive record of a case in which, after a week's repose of the parts secured by the use of nutritive enemata, it became practicable to pass a bongie easily into the stomach, though impracticable previously, and the patient became able to take cod-liver oil and nourishing food, so that he quitted the hospital relieved. In concluding this chapter, attention is directed to *gastric solution* of the lower extremity of the oesophagus. The paucity of reliable information on diseases of the oesophagus renders this chapter exceedingly valuable.

In Chapter V., on Organic Diseases of the Stomach, dilatation, which was not discussed in the first edition, is illustrated by a table of 18 cases, chiefly from the post-mortem records of Guy's Hospital. The chief causes of this condition are stated as *obstruction*, *paralysis*, and the *paralysis of simple over-distension*. The peculiar form of the stomach, hollowness at the epigastrium, and a splashing sound on percussion, are indicated as the special diagnostic features. Kussmaul's treatment by washing out the organ is recommended as worthy of trial, and the importance of rest by the use of nutrient injections for a time, inculcated.

Catarrh of the stomach is described under the synonymous appellations of acute catarrhal gastritis, inflammatory dyspepsia, subacute inflammation. It is stated that there is a predisposition to this form of disease in strumous subjects, to be distinguished, however, from a sympathetic irritation of the stomach in the early stage of disease of the lungs and of the brain, and from a general condition of exhaustion towards the close of phthisis, closely simulating chronic gastritis, and implicating the intestines likewise. Alkalies, salines, and cold drinks, with sedatives to relieve the pain, are recommended in the treatment of acute catarrh, with avoidance of vegetable food, and the use of acid fruits. Leeches and blisters are mentioned as often of service, and likewise benefit from the introduction of a seton at the pit of the stomach.

In the remarks on ulceration of the stomach, we notice reference to a frequent association of hemorrhagic erosion with disease of the heart and lungs as shown by a list of fourteen cases tabulated from "Guy's Post-mortem Records." Chloric ether, with carbonate of sodium and mucilage mixture or almond emul-

sion, is mentioned as often of great service in relieving the pain of superficial ulceration, and rendering the stomach more tolerant of food.

The subject of perforating ulcer of the stomach is discussed in fuller detail, and a table is given of the seat, etc., in sixty-five cases from the post-mortem room of Guy's Hospital during the last twenty years. Dr. Brinton is prominently alluded to as an investigator in this branch of pathology, as well as other authors identified with the subject. It appears that the ulcer is much more frequent in females than in males (440 : 214, Brinton; 183 : 69, Lebert; 91 : 22, Bamberger); but the personal experience of the author, as far as it has gone, has shown the excess in males, 35 : 28, and he accounts for the discrepancy by the different sources whence the figures are obtained, believing it probable that some of the cases which did not reach the post-mortem room may have been gastralgia, subacute gastritis, or gastric catarrh. The usual symptoms of ulcer of the stomach and their differentiation from those of carcinoma are discussed with great clearness and precision. With regard to the occasional prolonged duration of life after the symptoms have been manifested, it is mentioned that in one case they were said to have extended over forty years. The subject of appropriate diet and medicine is carefully presented in a manner adapted to the exigencies of the usual contingencies.

Fibroid degeneration of the pylorus is carefully differentiated from carcinoma, and the latter subject, in its turn, receives an extended discussion, including a tabulated detail of 79 cases, chiefly from Guy's Hospital.

Chapter VII., on the Duodenum, is a very important one to the practitioner, as diseases of this portion of the alimentary canal are frequently mistaken for affections elsewhere. In the first edition it had been remarked that the statements as to ulcerations of the duodenum following burns had not been confirmed by certain observations made at Guy's Hospital, although a specimen of the kind existed in the museum; and it is now stated that since that former edition was written three cases of ulceration of the duodenum after burns have occurred at Guy's. These observations as to ulcers of stomach and duodenum only serve to prove how statistics from reliable sources may fail to be verified by individual series of observations, even when made under exceptionally favourable opportunities, and how important it is not to be carried too far in generalizing from one's own experience.

In Chapter X., on Diseases of the Cæcum and Appendix Cæci, unusual mobility of the cæcum, due to a long mesenteric attachment, is stated to be far from rare, and is considered of great pathological importance, as it allows the cæcum to pass into hernial sacs, and to change its position when there is intestinal obstruction or great distension from other causes. Three varieties of rotary motion, described by Rokitansky, are discussed; rotation of the intestine upon its own axis, upon the mesentery as an axis, and upon another coil of intestine. The diverse characters of the appendix cæci are discussed at greater length. Atrophy of the intestine, a condition more common in advanced life, and in struma and phthisis, is shown to cause a globular or almost hernial bulging of the right side of the cæcum on account of its being but partially covered by the longitudinal bands, and the author has observed that by the contraction of a cicatrix, this sacculated portion has become almost shut off, so as to reduce the calibre of the passage from the ileum to the ascending colon, to about that of the ileum itself. Ulceration of the cæcum is stated to be rare as an independent disease, but frequent, when associated with other morbid conditions, as phthisis, enteric fever, and dysentery; and is often present from over stretching, as in obstruction of the sigmoid flexure, the mucous membrane yielding in transverse lines, as the skin does when ulcerating under similar over-stretching. The peritonitis which

ensues in typhlo-enteritis in the absence of adhesions, is described as almost as sudden in its symptoms, and as fatal in its results, as perforation of the stomach ; but, as has been shown by M. Leudel, the accuracy of whose observations the author can fully affirm, extravasation is prevented by antecedent adhesions, in cases much more numerous than is generally supposed. In discussing the points of differential diagnosis, the author mentions prominently that he has known cases where the peritonitis from cæcal perforation was regarded at first as gall-stone, the sudden pain on the right side, with violent vomiting, closely simulating the symptoms of that disease. The indications of treatment are precise and expressed in positive terms, and caution is inculcated against attempts to leave the bed and use slight muscular effort when the pain has subsided, and the febrile excitement has disappeared, as they are exceedingly injudicious, and sometimes followed by a fatal result.

In the article on typhoid disease of the intestine, we notice an allusion to reduction of the pyrexia by the cautious use of cold water, in some cases of enteric fever, coupled with an injunction of great caution when there is evidence of severe intestinal affection, lest perforation be induced or fatal collapse ensue.

In Chapter XVI., on Organic Obstruction, Internal Strangulation, Intussusception, Carcinoma of Intestine, it is stated that of 7934 examinations recorded in the post-mortem rooms of Guy's Hospital during 23 years, twenty-five instances of fatal obstruction by bands are described. There were 114 cases of intestinal obstruction, including strictures of all kinds; 17 cases of intussusception; 8 of twisting of volvulus; 20 of adhesions and contractions. As regards the symptoms produced in these several conditions, it was found that those of internal strangulation and acute obstruction from twisting or compression differ from those due to intussusception, and from the more gradual disease due to cancerous growth; these three being taken as examples of the several varieties above enumerated.

Chapter XIX., on Peritonitis, is new, and discusses the pathological manifestations of acute peritonitis, chronic peritonitis, and peritonitis from cancerous disease with considerable detail, as well as their symptoms and diagnosis. The author has not found peritonitis to be an idiopathic disease. Out of 501 instances of peritonitis in 3752 inspections made at Guy's Hospital, he did not find a single case thoroughly recorded in which disease could be correctly regarded as existing solely in the serous membrane. Of these 501 cases, 261 were from direct extension of disease from adjoining viscera, direct injury, etc.; 94 were connected with blood changes in the course of albuminuria, pyæmia, puerperal fever, erysipelas, etc.; and 146 were connected with general or local perverted nutrition. Thirty-five of the first series of 261 cases were caused by injuries or operations directly affecting the serous membrane. Of these operations one was for removal of an ovarian cyst, one a case of gastrotomy, and fourteen were cases of paracentesis abdominis; five of the latter having been to relieve ascites accompanying cirrhosis, two for ascites with heart disease, and seven to empty large ovarian cysts. Our author remarks that in instances of ascites from heart disease, chronic bronchitis, and cirrhosis, the whole of the peritoneal capillaries are in a state of continued hyperæmia, and a very slight fresh exciting cause is sufficient to produce acute disease; and that if a large number of instances of paracentesis abdominis had been taken, it would have been found that in ovarian disease, especially of persons advanced in life, paracentesis is much less frequently followed by a severe and fatal result than in ascites following cirrhosis. Of the 501 cases of peritonitis, perforation occurred 56 times.

In the treatment of peritonitis, the consideration of its origin is deemed the best guide. Opium in full and repeated doses is regarded as of the greatest

value, not only in cases of perforation, but in cases of acute inflammation from extension of disease, while the injudicious attempt to relieve pain by purgatives, carminatives and stimulants may deprive the patient of the hope of recovery. The various other indications are lucidly presented, both as to what should be avoided and what should be employed.

The great value of this volume of Dr. Habershon resides in the fact that it is based upon copious and well studied personal observations, a large number of which are described with more or less detail, so that their salient points confirm the tenor of the text; and it could but rarely happen that a case of abdominal disorder, unfamiliar to the family practitioner, and even to a consultant in large practice, would not find an analogue in its carefully prepared pages. It is a book to be consulted with advantage in the study of individual cases of disease such as it portrays, and, as such, supplies the deficiencies inseparable from the scope of generalized treatises. The present edition is still more valuable than the first, containing additional information, and a number of important tables, as well as exhibiting conscientious revision of its previous material.

The typographical execution of the volume sustains the well-known reputation of the publisher.

J. S. C.

ART. XXXV.—*Report of Investigations into the Pathogeny of Diphtheria.*

Conducted by EDWARD CURTIS, M.D., and THOMAS E. SATTERTHWAITE, M.D. 8vo. pp. 56.

THIS is a report, dated Feb. 11, 1877, to the Board of Health of the city of New York, from the honorary microscopist to the Board, Dr. Curtis, at whose request Dr. Satterthwaite was associated with him, in complying with a resolution desiring that he should investigate the causes and nature of diphtheria by means of micro-pathological examinations and otherwise. The report is presented in two parts. Part I. is a general report, and Part II. is a record of experiments.

The investigators took for their subject, *What is the nature of the infectious principle of diphtheria, and what are the circumstances that determine the infection?* Abundant evidence was found of the existence of the forms of bacteria described by other observers, "but these forms were in nowise different in optical or chemical behaviour from the bacteria found in putrescent but non-diphtheritic animal matters."

Experiments were made by inoculating rabbits with diphtheritic material, the animal being chosen partly from lack of facilities for dealing with larger or more troublesome animals, and partly because some German investigations, with which those under discussion were to be compared, had been conducted upon rabbits. Circumstances forced a termination to the investigations before a number of the projected points of inquiry had been sufficiently studied to draw conclusions from them. The results of the investigations made are summed up in nine propositions, not, however, put forth as proven. Condensing these propositions, it appears, 1, that although inoculation of diphtheritic membrane into the muscular tissue of the rabbit produces severe local lesions, and even constitutional disturbance and death, these effects differ too much in their pathology and clinical history from diphtheria in the human subject, to warrant defining them as diphtheria.

2. Similar effects can be produced by inoculation even of a material non-infectious to the human subject, under conditions where diphtheritic membrane is infectious—this material being pulpy scrapings of the upper surface of the healthy human tongue.

3. Effects generally similar, but less intense, can be produced even with Cohn's fluid (an aqueous solution of ammonic tartrate, potassic and calcic phosphates, and magnesic sulphate), allowed to decompose spontaneously.

4. These effects are not due to simple mechanical irritation, for inoculations of sand produce no effect whatever.

5. Thorough filtration of a proven virulent aqueous infusion of diphtheritic membrane, or of putrid Cohn's fluid, removes their infectious properties.

6. Thorough trituration of proven virulent diphtheritic membrane and tongue-scrapings, with a high percentage of salicylic acid, fails to remove the intensity of the infectious quality of these substances, or even markedly to modify it.

7. There is no theoretical ground for assuming that preventing the bacteria of a diphtheritic patch from making their way through the underlying mucous membrane, will, in itself, prevent general diphtheritic infection of the system.

8. There is no relation between inoculable virulence of a diphtheritic membrane and the period, within three days, that has elapsed between the detachment of the membrane and inoculation with the same, nor between inoculable virulence and gross amount of bacteria present in the membrane. And

9. There is a rough relation between inoculable virulence of a diphtheritic membrane and the severity of the original case of diphtheria, so far as this can be estimated by the termination of the case in death or recovery.

Part II. comprises a record from 206 experiments, which form the basis of the above conclusions. These are divided into, 1, inoculations with diphtheritic matter; 2, inoculations of scrapings from the healthy human tongue; 3, inoculations of decomposed Cohn's solution; 4, inoculations of putrid infusions of calf's liver; 5, inoculations of sand; 6, inoculations of salicylic acid; 7, inoculations of salicylic acid and vaccine virus; and 8, experiments to test the power of salicylic acid to prevent the development of bacteria in putrefiable fluids.

In looking over these records, numbers of which are presented in detail, and others in a more or less general manner, we became aware of the conscientious performance of a great amount of varied labour. Thus, the inoculations with diphtheritic matter were made with pure membrane, with its aqueous infusion, cold and boiled, filtered and putrid, with the reddened mucous membrane of the trachea, kidney-tissue, and with a mixture of pure membrane and salicylic acid; and these, with the other materials employed, were also varied in somewhat similar manner. A great many microscopic examinations were made of the products at the site of the inoculations, and of various organs after death.

Much as the ingenuity and pertinacity of these experiments may be appreciated, it is questionable whether anything has been learned in solution of the inquiry as to the causes and nature of diphtheria. Inoculations of the cornea of the rabbit failed, in the hands of Drs. Curtis and Satterthwaite, to produce extensive diphtheritic keratitis with constitutional symptoms, and even termination in death, as announced by Eberth. Nothing resulted but small local spots of inflammation at the site of each puncture, which appeared the day after infection, and, speedily subsiding, left the eye well by the fourth or sixth day. Hence, subsequent inoculations were made into the muscular, or into the subcutaneous connective tissues; and the results confirmed those of other investigators in producing poisonous effects, fatal in the majority of instances. These effects, however, were deemed manifestations of local irritant poisoning, and not evidences of diphtheria, for similar results followed inoculation with scrapings from the upper surface of a somewhat furred tongue in the healthy subject, and to a less extent with inoculations of putrescent Cohn's solution.

To offer a fair prospect of success, experiments with diphtheritic products and other presumed sources of contagion, should be made upon animals known or

suspected to be susceptible to diphtheria, as contended for by some veterinary surgeons. Rabbits, evidently, are not good subjects for the infection of diphtheria.

The negative value of the investigations under consideration, as far as they go, is incontestable, and their record is presented in a straightforward manner that commends the little pamphlet to the study of those inclined to continue the same field of inquiry.

J. S. C.

ART. XXXVI.—*Notes on Rheumatism.* By JULIUS POLLOCK, M.D., F.R.C.P., Senior Physician and Lecturer on Medicine, Charing Cross Hospital, etc. 12mo. pp. 115. London: J. & A. Churchill, 1879.

“THE Treatment of Acute Articular Rheumatism by the Salicylate of Soda, with Notes of Cases,” would be a more appropriate title for this little essay than the one it bears; but the author was probably deterred from adopting it by the fact that it has lost somewhat of the appearance of originality. The three chapters, extending over seventy-two pages, on muscular rheumatism, have been interpolated apparently solely with the object of justifying the more comprehensive title, but being foreign to the general tenor of the article, they had better have been omitted, especially since they add nothing to existing knowledge on the subject. Moreover, the term muscular rheumatism, as generally applied and used in this book, is a misnomer; it has nothing in common with true rheumatism; it is not an active inflammation, is not attended by fever, does not run a definite course, and has no tendency to heart complication. If further proof of its distinct nature were needed, it is found in the general opinion of observers that it is certainly not relieved by salicylate of soda, which exerts almost a specific influence over rheumatism. While its pathology is obscure, it is evidently a local and not a general disease. Its etiology is closely connected with muscular mal-nutrition and an abnormal condition of certain muscular fibrillæ or sarcous elements, and is favoured by causes that depress the system, aided by local strain, fatigue, or exposure to dampness and cold. The term myalgia, proposed by Inman, is now coming into general use, to express this condition, in which pain is produced in a muscle obliged to work when its structure is imperfectly nourished, or impaired by disease (Anstie); and while possessing the negative merit of not expressing any opinion as to the pathology of the morbid state, at the same time it is free from the positive objection of grouping under a common title diseases essentially different. It is not intended, however, to deny the existence of transitory pains around the joints, and stiffness or contracture of tendons which are often encountered in rheumatic subjects, and which are also unaccompanied by fever, and may occur simultaneously in several different portions of the body. These are accompanied by signs of the rheumatic diathesis, and are benefited by alkalies and a non-nitrogenized diet. Myalgia, on the contrary, is located permanently in certain muscles, which are tender to the touch and are subject to painful spasm; it is not connected with a special diathesis, and is caused by overwork and under-feeding, with accidents of exposure to cold. It is to be treated by rest, anodyne applications, tonics, and nitrogenized food; and in the way of prophylaxis we should remember that, as mentioned by our author, “to avoid muscular rheumatism, we must shun those things that produce it,” such as cold and damp, straining, overwork, and dyspepsia.

The experience of Dr. Pollock leads him to fully indorse the salicylate of soda treatment of articular rheumatism, and the clinical notes of sixteen cases thus treated are given in the appendix.

F. W.

ART. XXVII.—*A Treatise on the Diseases of Infancy and Childhood.* By J. LEWIS SMITH, M.D., Clinical Prof. of Diseases of Children in Bellevue Hospital Medical College, etc. Fourth edition. Thoroughly revised. 8vo. pp. 758. Philadelphia: Henry C. Lea, 1879.

THE high appreciation in which this excellent work is held by the profession is best attested by the fact that on the completion of its first decade it has reached a fourth edition, and it only remains for us to add that the revision which it has just undergone brings its teachings fully abreast the latest advances of medical knowledge.

We notice marked evidences of revision in the chapters on scarlatina and on diphtheria. Dr. Smith holds that the natural course of scarlatina cannot be shortened or aborted by treatment, and that carbolic acid, salicylic acid, or any other known remedy cannot be safely used in sufficiently large doses to antagonize the specific poison in the system. He is also an uncompromising believer in the constitutional character of diphtheria, and thinks that incalculable mischief has been done by the teachings of Oertel as to the local infectious origin of this disease. He earnestly advocates constitutional treatment from the beginning as of paramount importance, and holds that the indications are, as in scarlet fever, to sustain the patient by the most nutritious diet, by tonics, and a liberal use of stimulants, and to employ other measures, general and local, as adjuvants to meet special indications which may arise.

In the treatment of intussusception, "when pressure from below by water, air, or gas, which is the only efficient mode of treatment short of the knife, has been tried sufficiently long and often without result," Dr. Smith urges that surgical advice in reference to laparotomy, be sought, and adds that "laparotomy performed on the first or second day will be much more likely to save life in ordinary cases than if performed later, since the strangulated intestine is soon badly damaged, and a local peritonitis is apt to be developed any time after the first forty-eight hours."

Dr. Smith has written such an excellent treatise that we cannot but wish that in his next edition he would supply a deficiency conspicuous in all our text-books on diseases of children—a complete chapter on infant diet in health and disease. The importance of this subject is universally recognized, yet, strange to say, there is no systematic work, so far as we know, with perhaps the single exception of Eustace Smith on *Wasting Diseases of Children*, in which the subject is at all fully treated.

I. M. H.

ART. XXXVIII.—*Trattato Pratico delle Malattie delle Donne*, per T. GAILLARD THOMAS. Dottore in Medicina, Professore di Ostetricia e Malattie delle Donne e dei Brambini nel Collegio dei Medici e Chirurghi di Nuova York, etc. etc. Versione Italiana Dall' originale Inglese, dei Dottori L. GIUNTOLI e P. BOTTONI. Con 191 figure intercalate nel testo. Prima edizione. 8vo. pp. 870. Firenze. Tipografia di Eduardo Ducei, 1877.

A Practical Treatise upon the Diseases of Women, by T. GAILLARD THOMAS, M.D., Professor of Obstetrics and Diseases of Women and Children in the College of Physicians and Surgeons of New York, etc. etc. *Italian Translation from the original English*, by Doctors L. GIUNTOLI and P. BOTTONI.

THIS large octavo volume of 870 pages pays quite a handsome compliment to the recently-elected President of the American Gynaecological Society, and author

of the work of which it is a translation. Like the contributions to medical science of their own distinguished Professor of Bologna, Francesco Rizzoli, the volume by Dr. Thomas derives much of its value from his own extensive experience, so much made use of in its preparation. Appreciating this, the translators say at different points of their preface : The work of Professor Thomas, in all its relations, leaves nothing to desire. It is particularly preferable to other works of the same kind by reason of the eminently practical spirit which pervades it. . . . "We believe that it will contribute effectively to the advancement of gynaecology in Italy." The translation is dedicated to "The Illustrious Professor Pietro Cipriani, President, and Teacher of Clinical Medicine in the School of Florence, and Senator and Chief Physician of the Kingdom."

The translators of Dr. Thomas's work have confined themselves almost entirely to the reproduction of the text in their own tongue ; but there are a few explanatory foot-notes, one of which is an amusing interpretation of the expression, "our Milesian population"—"la nostra popolazione Milesia." "It applies to that population which is found scattered through North America, and which originating in Ireland, has preserved the customs, religion, etc. of the country from which they originated. They are called in America, Milesian." Page 23. Considering that the term is not found in any of the leading dictionaries in the English language, it is more remarkable that the translators should have known that it applied to the Celtic Irish, than that they should have thought this population was sparsely distributed among us, where they abound in every large town across the continent.

The reproduction of so large a work in Italy is another of the many evidences of the high appreciation in which the labours of American gynaecologists are held abroad.

R. P. H.

ART. XXXIX.—*A Treatise on Therapeutics, comprising Materia Medica and Toxicology, with especial reference to the Application of the Physiological Action of Drugs to Clinical Medicine.* By H. C. WOOD, Jr., M.D., Professor of Materia Medica and Therapeutics in the University of Pennsylvania. Third edition, revised and enlarged. 8vo. pp. 720. Philadelphia: J. B. Lippincott & Co., 1879.

In the present edition of this well-known and justly-esteemed work, no very essential changes are to be observed, but a few articles, especially those upon salicylic acid and jaborandi, have been rewritten to correspond with the most recent inquiries upon these subjects, and a few others, mostly upon drugs of comparatively slight importance, have been added. We may notice the same thoroughness of research into the literature of therapeutics which has marked former editions, as well as the ability with which the results are utilized.

As a teacher of therapeutics, the writer cannot help wishing that a "student's edition" of this work might be prepared, in which the various authorities, so confusing to the student, especially when arrayed, as science so often demands, on opposite sides of some question, might be "boiled down," and, so far as may be, harmonized by a competent hand, best of all, the author's.

If the beginner is to get any clear notions of experimental therapeutics whatever, and especially if he is to trust his memory for them after being once acquired, a little scientific nicety must sometimes be sacrificed in his behalf in favour of clearness and decision of statement.

R. T. E.

ART. XL.—*A Guide to Therapeutics and Materia Medica.* By RORERT FARQUHARSON, M.D. Edin., Lecturer on Materia Medica at St. Mary's Hospital Medical School. 2d American edition. Revised by the Author. *Enlarged and adapted to the United States Pharmacopœia,* by FRANK WOOD-BURY, M.D. 12mo. pp. 498. Philadelphia: Henry C. Lea, 1879.

FEW authors receive so great a compliment as the call for a second edition within eighteen months from the first appearance of their work, and while the most popular books are not necessarily the best, in the case before us, to a great extent owing to the energy and skill of its American editor, its merit keeps pace with its popularity.

This issue, though containing nearly a hundred pages more than its predecessor, through the substitution of thinner paper, shows very little increase in bulk. The numerous additions, which are contributed both by the author and editor, rectify the faults of omission in the previous edition, and add largely to the value and general usefulness of the work. We notice, however, that many of the erroneous doses and proportions given in the first edition still remain uncorrected.

R. M. S.

ART. XLI.—*Essays in Surgical Anatomy and Surgery.* By JOHN A. WYETH, M.D. 8vo. pp. 262. New York: Wm. Wood & Co., 1879.

THIS volume contains five papers: The surgical anatomy and history of the carotid arteries, of the innominate and subclavian arteries, the surgical anatomy of the tibio-tarsal region, of the obturator artery, and notes on the surgical anatomy of the hip joint. The first three are the most important essays, and were presented in competition for prizes offered by the American Medical Association and the Alumni Association of Bellevue College. The fact that they were successful in obtaining these prizes attests their merit.

It is always a mistake to affix to a book a title that gives no indication of its contents, hence it would have been better if the author had named his production "The Surgical Anatomy of the Great Vessels of the Neck;" since 246 pages of the 262 are devoted to the anatomy and surgery of the carotid, subclavian, and innominate arteries.

The great amount of original investigation and research that has been given to the work is evident when it is stated that the position of origin of the eight branches of the external carotid artery was accurately measured in 121 dissections; and that tables of ligations of the great vessels of the neck were compiled from every available source. In the case of the common carotid the number of operations tabulated is 789. From these dissections and statistical tables elaborate deductions have been formulated regarding the proper point of ligation in various surgical conditions. Excellent illustrations show the average variation of origin of the branches, the relations of the veins, and the proper point for ligating the trunk. The discussion of the innominate and subclavian arteries is conducted in a similar way. The last three essays are excellent, but they are thrown into strong shadow by the brilliancy of their associates; the one on the anatomy of the tibio-tarsal region appeared originally in this Journal (1876).

The author's conclusions are so important and based on such good evidence, that it may be well to mention at least some of them. The most astonishing of

his results is the comparative mortality following ligation of the common and external carotid arteries. While 41 per cent. of the cases operated upon die after ligation of the common trunk, only 4½ per cent. prove fatal after tying the external carotid; hence "the common carotid should never be tied for a lesion of the external carotid, or its branches, when there is room enough between the lesion and the bifurcation of the primitive carotid to permit the ligation of the external." When discussing the method of tying the external vessel he says that the ligature in the majority of cases may be applied in one of two positions, viz.: between the origins of the superior thyroid and lingual, about one-quarter inch above the bifurcation, or between the facial and posterior auricular about one inch and a half above the thyroid cartilage. When discussing the internal carotid artery the author says that in all intra-cranial lesions involving alone the internal carotid or its branches, this vessel should be tied first; and if the treatment does not prove successful, the external carotid is then to be ligated at the crossing of the digastric muscle. When it is found that the facial is given off below this point it is necessary to secure it also, because of the intimate anastomosis between its terminal branches and the intracranial branches of the internal carotid. In cases of wounds of the internal carotid in the neck it should be ligated above and below the lesion in every instance, since secondary hemorrhage is liable to occur from the descending current by means of the circle of Willis.

From what has been said it is apparent that the volume contains much of great value to the surgeon, and that it will repay one who opens it for perusal, because the deductions are derived from careful and accurate dissections and intelligent study of a very large number of cases.

J. B. R.

ART. XLII.—*Atlas of Skin Diseases.* By LOUIS A. DUHRING, M.D., Professor of Skin Diseases in Hospital of University of Pennsylvania; Physician to Dispensary for Skin Diseases, Philadelphia; Dermatologist to Philadelphia Hospital, etc. Part V. Philadelphia: J. B. Lippincott & Co., 1879.

THIS part contains portraits of scabies, herpes zoster, tinea sycosis, and eczema (vesiculosum); portraits executed with the same literal faithfulness, and of the same artistic merit, which have characterized the preceding numbers. The first of the series, representing an aggravated case of itch, reproduces as successfully as possible the minute and typical lesion of this affection, the burrow of the female parasite, as well as the gravest secondary forms of eruption. To the younger class of physicians, who no longer have opportunity of making themselves familiar with the appearances of this fluctuating disease, this plate will be of especial service in the diagnosis of suspected cases. The second illustration is a very good one of thoracic shingles. The third is a most excellent and long needed picture of parasitic sycosis, the only coloured and satisfactory representation of the affection ever published. So much confusion prevails in respect to the differential diagnosis between it, the non-parasitic form, and eczema of the bearded face, that the appearance of this plate is of especial importance in dermatology. The fourth is a representation of vesicular eczema, one of the rarest forms of this common malady. In a hundred cases of the disease, as they present themselves at a clinic, opportunities of showing this, the typical lesion of Willan's school, are very infrequent, excepting the dermatitis be of extraneous origin. The text accompanying the atlas presents, as before, a simple, brief, and clear description of the disease, and of the case illustrated.

J. C. W.

ART. XLIII.—*Habitual Drunkenness, and Insane Drunkards.* By JOHN CHARLES BUCKNILL, M.D., Lond., F.R.S.; Late Lord Chancellor's Visitor of Lunatics. 16mo. pp. xxx., 103. London: Macmillan & Co., 1878.

ATTEMPTS have been recently made in Great Britain to induce Parliament to pass an act providing for compulsory confinement and detention, with a view to curative treatment, in the cases of persons who might be adjudged "habitual drunkards." Of course this implies assent to, or tolerance of, the proposition that the condition is one of disease rather than of depravity.

Our readers are well aware that many members of the profession, taking a broad view of all the antecedents, conditions, and circumstances, connected with habitual ineptity, have been disposed to think, that, oftentimes, the victim is to be pitied for his unhealthy organization, as much as, or more than, blamed, for his vicious propensity. Some attach more weight, and some less, to the possible agency of hereditary influence, nourishment (or the want of it), labour, recreations, etc. They do not necessarily look upon every drunkard as absolutely, or even possibly, insane. When, however, they find in vital or ancestral antecedents, causes which are known to produce insanity, or epilepsy, or general nervous debility, or habitual resort to the nepenthe of alcohol, they do not perceive that they are offending against good sense, nor yet good morals, by using the words "disease" and "diseased," in speaking of the state and the man. Very naturally, therefore, they have found nothing, *a priori*, absurd or improper in the idea of having asylums or hospitals aiming at the "cure" of such persons.

Not so, however, thinks Dr. Bucknill. Both idea and act, principle and execution, meet his most emphatic dissent. To be sure, he admits in a general way that drunken habits may sometimes be a symptom or result of insanity; but maintains that other proofs of unsoundness may always be detected; and that, moreover, such cases are incurable. We are not always quite able to reconcile the doctor's different utterances. It seems sometimes as if he assented to the "disease theory," in the abstract, while ignoring it in the concrete. His oftenest reiterated creed, however, is that habitual drunkenness is a vice, to be punished, and if possible, reformed; not a malady to be commiserated and cured.

Just how much Dr. Bucknill's observations in this country had to do with his present views we cannot exactly determine. He frankly admits, however, that his impressions of inebrate asylums, as here existent, were anything but favourable. Bad management, insincerity, deception, misrepresentation of results, lack of any regular treatment, and general hollowness, are, in effect, the accusations which his judgment forces him to bring against some of those which he visited. In a few cases he found the asylums abandoned, or diverted to different purposes. Elsewhere, where no suspicion might attach to the entire honesty and good intentions of the management, there was a manifest want of common sense, and knowledge of human nature—especially as affected by drink—and, to put it plainly, a somewhat strong infusion of cant. In one or two exceptional instances, where he found reason to believe that reformation was earnestly laboured for, and partially, at least, with success, it was in establishments professedly religious and reformatory—not medical or curative.

Perhaps it will not be altogether surprising to those of us who have noticed the history of American Inebriate Asylums, that our distinguished visitor should have been both disappointed and disgusted with some chapters in their history.

One of the doctor's objections to the proposed legislation is that in practice it would result in the wealthier inebrates being considered as unfortunate sick men, while their poorer brethren would continue to suffer sentences as law-breakers.

If, however, it were proposed to establish curative asylums for the poor, at State cost, the great number requiring treatment would constitute a perfectly intolerable burden on the temperate rate-payers. Moreover, many men would be confined, who, in spite of their bad habits, are the support of their families. And confinement for months or even years, was contemplated by the proposed legislation.

Whether any efficient means have been or will be devised for the reformation (or cure) of ineptiety, outside of such influences as hygiene, good food, wholesome apartments, education, innocent recreation, etc., we very much doubt. As to such legislation as is opposed by our author, we cannot but agree with him that it is crude, unwise, and worse than useless.

We believe that Dr. Bucknill is right in opposing the universal confinement of drunkards as victims of disease. But we as surely believe that excessive use of stimulants is not unfrequently a manifestation—sometimes the only one—of disease. Cases are to be viewed and treated individually. As to the alleged injustice in giving to the rich privileges denied to the poor, by allowing pay hospitals without establishing free ones, we can only say that wealth always has commanded and always will command more of ease and luxury and opportunity than poverty can expect to attain. We do not know why those able to pay should not command whatever means of cure or reformation may seem to them to promise help. We cannot see why the State should, therefore, be under obligation to provide like means for the less fortunate classes.

As to the expediency of any special laws providing for the enforced confinement of any class of drunkards, we are much disposed to agree with Dr. Bucknill in deeming them unwise. We also agree with him in considering drunkards as unfit and harmful inmates for insane hospitals. Then, is it not right and proper to allow of institutions expressly designed for persons able and willing to become patients voluntarily, whether the attempted change be termed a "reformation" or a "cure"?

B. L. R.

ART. XLIV.—*A Guide to the Qualitative and Quantitative Analysis of the Urine; designed for Physicians, Chemists, and Pharmacists.* By DR. C. NEUBAUER and J. VOGEL, with a preface by Prof. D. R. FRESENIUS. Translated from the seventh enlarged and revised German edition by ELBRIDGE G. CUTLER, M.D., Pathologist at the Boston City Hospital, etc. Revised by EDWARD S. WOOD, M.D., Prof. of Chemistry in the Medical School of Harvard University. 8vo. pp. xxiv., 551. New York: Wm. Wood & Co., 1879.

WITH regard to so well known a work, it is only necessary to say that a new English edition is now issued after the lapse of many years. The Sydenham Society's edition, translated by Markham, appeared in 1863. Since then so many editions of the original work have been issued, that the Sydenham has long since failed to represent the book in its more modern German dress.

Being by far the most complete and exhaustive treatise on the subject, it is absolutely indispensable to every working urologist. The latter is therefore under no slight obligation to the translator; for even the tolerably fluent reader of German will admit there is a vast saving of time in the reading of a book in one's mother tongue. Even a greater service is rendered to the much larger number of English readers to whom the book is now opened for the first time, and we predict for it a success which will be commensurate with the labour and expense of its preparation.

J. T.

QUARTERLY SUMMARY
OF THE
IMPROVEMENTS AND DISCOVERIES
IN THE
MEDICAL SCIENCES.

ANATOMY AND PHYSIOLOGY.

Case of Total Absence of the Spleen.

The following curious fact is related by KOCH and WACHSMUTH in the *Berliner Klinische Wochenschrift*, February 10, 1879. On the 6th of December, 1878, in the hospital of Altona, there died a large, strongly-built, muscular plumber, who had been received two days before with his son, a lad aged 15, who was ill with typhoid fever. The father was feeling very unwell; his temperature was very high. He had profuse diarrhoea, together with a few rose-coloured spots, suggesting the probability of the same affection from which his son was suffering, especially as he had been nursing him. The spleen, however, could neither be palpated nor percussed, and the examination of the patient revealed only bronchopneumonia of the right side of the chest. At the necropsy, this latter diagnosis having been confirmed, the authors proceeded to examine the spleen, which, to their great astonishment, they could not find anywhere. All the intestines were perfectly normal, as to their size and situation, but there was neither a spleen nor a vessel corresponding to the arteria splenica.—*London Med. Record*, May 15, 1879.

Case of Obliteration of Vena Cava Inferior, with great Stenosis of Orifices of Hepatic Veins.

Dr. WILLIAM OSLER, Prof. of Institutes of Medicine in M'Gill University, Montreal, reports (*Journal of Anat. and Phys.*, April, 1879) a case of obliteration of the inferior vena cava, in which the obliteration can neither be traced to compression nor to the extension of a thrombus, and which had probably lasted some years, the vein being converted into a firm fibrous cord; and the hepatic veins, where they enter the cava, are so far involved as to be reduced to the condition of insignificant orifices. The collateral circulation was carried on chiefly by the azygos vein, which also provided accommodation for a considerable proportion of the blood of the portal system.

The absence from the clinical history of the case of any acute illness which may be supposed to correspond to the date of occlusion, and the general backwardness of nutrition which was observed, favours the view of the obliteration being congenital, but there is nothing else to support it. Whatever may have

been the primary cause of the obliteration, it must have led to the formation of a thrombus, the final transformation of which is represented by the cord-like structure mentioned above.

The clinical history of the case and the notes of the post-mortem examination are minutely given.

Physiological Albuminuria.

Dr. MARCACCI, in a communication to the Medical Society of Florence on May 12, 1878, and reported lately in *L'Imparziale*, observes that the presence of albumen in the urine is considered by the majority of physicians as the index of a pathological condition, although Bernard, Vogel, Hoffman, and others, have pointed out that albuminuria may be met with in men whose health is perfect, and under certain conditions of alimentation. The excessive consumption of eggs is only one of the conditions of this sort of physiological albuminuria. It is somewhat difficult to prove that the presence of albumen is not related either to a morbid state or to a special *régime*. Moreover, there exists a certain number of cases of error. In these researches, it is only with small quantities of albumen that one deals, while the blood, pus, and the urethral mucus, or that of the other neighbouring organs or prostatic fluid, may in themselves constitute a cause of error when they are mixed with the urine. Nevertheless, according to M. Marcacci, a series of observations made upon himself has proved to him that albumen may be found in a physiological urine. Albumen, he says, is constantly absent in nocturnal urine; on the contrary, it is very rarely absent in diurnal urine; it is possible to make albumen appear in the diurnal urine by executing rotatory movements of the arm for from ten to fifteen minutes in such fashion as the pulse is raised from seventy-five to one hundred and fifteen pulsations a minute. These results are in some sort confirmatory of the researches made by Leube at Erlangen in 1877, which are worth while summarizing. Leube undertook his research on the soldiers of the garrison at Erlangen, and took the necessary precautions to avoid blenorragia. The following was his method of research. Fresh urine was filtered, and a certain quantity carried to the boiling point; the other was treated by nitric acid, both being compared with the intact urine on a block tablet. In the urine which showed opacity, a small quantity of acetic acid was added to precipitate the deposit. This precipitate was washed and treated by Millon's fluid, and another test was made with the liquor potassae, and possibly with the sulphate of copper and heat, when the purple red or violet colour was obtained with Millon's fluid, or the violet colour with the potassa, the urine was considered as albuminous. Leube examined the night urine of 119 soldiers. The number of observations was 154, which were thus divided: 90 soldiers were examined once, 23 were examined twice on two different days, and 6 were examined three times at intervals of three days. Briefly, out of 154 examples of nocturnal urine, only a very small quantity of albumen was found in five cases, and in only one case a notable proportion. Researches performed on the urine secreted during the day after military exercise, and in the months of June, July, and August, gave very different results; in fact, of five soldiers who had shown albumen in the night urine, a much larger quantity was found in the day, and further, albumen was found in eighteen soldiers who had not presented any in the night. Bringing the frequency of albumen in these observations to a percentage, it was found that the morning urine was albuminous in 5 soldiers out of 119, that is to say, in 4.2 per cent.; that of the middle of the day was albuminous in 19 soldiers out of the 119, that is to say, in 16 per cent. The day urine was only albuminous in 14 soldiers out of 119, that is to say, 11.8 per cent. Finally, the urine of the morning and that of the middle of the day were equally

albuminous in 5 soldiers out of 119, that is to say, in 4.2 per cent. It may be added, that the quantity of albumen in the urine most heavily loaded with that substance was from 37 to 38 milligrammes per cent. Such are the facts which seem to prove the possibility of albuminuria in the physiological state.—*British Med. Journal*, May 10, 1879.

Estimation of Sugar in the Urine.

A series of observations to determine the relative value of the more delicate methods of ascertaining the quantity of sugar in urine have been undertaken by Hagen and Müller. The object was especially to ascertain whether any other method was more reliable than that with Fehling's solution, which possesses the grave disadvantage that with very small quantities of sugar the oxide of copper which is formed is not precipitated. Where it can be employed, Fehling's method is considerably more accurate than estimation by polarization—some .3 to .4 per cent. For comparison with Fehling's solution they employed the reduction process of Knapp, in which a solution of mercury cyanide is used, which is decomposed on boiling with grape sugar, metallic mercury being precipitated. Their experience is that this method is thoroughly available for urinary analysis.

Their investigations were directed especially to the settlement of four questions: 1. Do the two methods give the same result? A series of twenty-six estimations of diabetic urine by each method showed that both methods agree. Pillitz arrived at the same conclusion. Hoppe Seyler thought Knapp's method much less accurate than that of Fehling. 2. Can Knapp's method be employed when Fehling's gives no result? According to these experiments, Fehling's method ceases to be available when the quantity of sugar is below .7 per cent. Knapp's method, however, could be employed down to .1 per cent. of sugar. It is true that so small a quantity of sugar can only be estimated with the greatest care. Every specimen of urine contains, in greater or less quantity, substances capable of causing reduction, and which act on the solution of both Fehling and Knapp just as sugar does. 3. Which of the two methods is to be preferred? Knapp's method is available in all cases, Fehling's only in a limited number. Knapp's solution can be prepared quickly and easily, can be kept without alteration, and can be employed for the estimation of sugar more rapidly than Fehling's. On these grounds they prefer Knapp's method. Of course, both it and Fehling's only show the quantity of reducing substance in the urine. 4. The estimation of sugar in albuminous urines. It is commonly assumed that the albumen must first be separated from the urine. It was shown that albumen hinders the precipitation of both mercury and copper, since the precipitate remains partly in solution and partly suspended. This action is not, however, distinct unless the albumen is more than .2 per cent., and if less than this the sugar may be estimated without preceding separation of albumen. This was demonstrated by a series of double estimations with and without the separation of the albumen. Lastly, the question is discussed how far it is justifiable to regard reducing power and sugar as correspondent. In urine which is free from sugar .087 to .37 per cent. of apparent sugar may be discovered, and this amount of error must evidently occur in every estimate of sugar in diabetic urine. It is urged that recent examinations of the blood all incur the same error, and, however accurately the oxide of copper may be estimated, this source of uncertainty remains. Lehmann's older observations were free from this source of error; from muscle, brain, and lungs, extracts were obtained which reduced abundantly, but contained no sugar.—*Lancet*, April 26, 1879.

MATERIA MEDICA AND THERAPEUTICS.

The Therapeutic Value of Croton Chloral.

In a very interesting paper read before the Ulster Medical Society Dr. RIDDELL (*Dublin Medical Journal*, April, 1879) reports his experiences of the great therapeutic value of croton (butyl) chloral. He mentions a case of severe paroxysmal headache ineffectually treated for many years by all the usual remedies of the *Pharmacopœia*, but cured by five grains of butyl-chloral twice daily and ten grains taken at night dissolved in spirits of wine and glycerine, with a little acid and syrup of orange to cover the flavour. The patient continues the five-grain doses at night and now enjoys better health than she has done for years. Since that case, Dr. Riddell says he has used it largely—sometimes failing, sometimes relieving—till, by keeping an account of all his cases, it began to be clear which were most benefited by the drug. Since then the number of cases relieved (some permanently) has increased. These cases are: headache in females arising from mental distress; those cases of headache frequent at the menopause—in fact, all those called neuralgic, except a few arising from internal mischief, are benefited, and in many instances cured. In that distressing species of neuralgia called tie douloureux, he has found it in many cases acting like a charm. Of course he does not include any arising from cranial or intracranial causes. He has tried it in neuralgia of the ovaries, but no good resulted. In insomnia, it is not so reliable as the hydrate: but in some cases, where the loss of, or inability to, sleep is accompanied by a weak or fatty heart, it is to be preferred, as it has no weakening effect on the central organ of the circulation. In one case of delirium tremens, where the circulation was very feeble, the combination of croton-chloral with digitalis had a wonderful effect, and it seemed as if the drugs could be given together in much smaller doses to produce the same results than singly. In this case he pushed it from ten to thirty grains every three hours, with drachm and two-drachm doses of the infusion of digitalis. In pain arising from caries of teeth, he has found it useless in most cases, and in all inferior to Richardson's "tinctura gelsemimi"; but in one case, of a nervous young lady, by giving her two ten-grain doses, he was able to extract a tooth next to painlessly, to her great satisfaction. It is in affections of those parts supplied by the fifth pair of nerves that it is of most use; but, to be of service, the drug must be given in far larger doses than prescribed in the *Pharmacopœia* for adults, five grains three or four times daily, gradually increasing if required; if stimulants be wanted, dissolve it in rectified spirit; if not, dissolve it in glycerine. In all cases complicated with hemorrhoids, give glycerine. If anaemia exist, combine it with iron, or, what he believes better, arsenic; then gradually lessen the chloral. In all cases he has found it better to give it in solution than in powder or pill. Dr. Riddell mentions also severe pain with photophobia and blepharospasm after injury, in which atropia failed, but ten grains of butyl-chloral repeated in an hour gave complete relief; and a case of acute painful facial carbuncle, in which the effect of ten-grain doses every three hours was "simply marvellous," the disease going through its frequent stages almost without the patient knowing anything of the matter from the sense of feeling.—*British Med. Journal*, May 3, 1879.

Defibrinated Blood for Rectal Alimentation.

At a late meeting of the Therapeutical Society of New York, Dr. ANDREW H. SMITH, Chairman of the Committee on Restoratives, presented a report (*New*

York Medical Journal, April, 1879) on this subject. From the facts before them the committee felt warranted in drawing the following conclusions :—

1. That defibrinated blood is admirably adapted for use for rectal alimentation.
2. That in doses of two to six ounces it is usually retained without any inconvenience, and is frequently so completely absorbed that very little trace of it can be discovered in the dejections.
3. That administered in this way once or twice a day, it produces in about one-third of the cases for the first few days more or less constipation of the bowels.
4. That in a small proportion of cases the constipation persists, and even becomes more decided the longer the enemata are continued.
5. That in a small percentage of cases irritability of the bowels attends its protracted use.
6. That it is a valuable aid to the stomach whenever the latter is inadequate to a complete nutrition of the system.
7. That its use is indicated in all cases not involving the large intestine, and requiring a tonic influence which cannot readily be obtained by remedies employed in the usual way.
8. That in favourable cases it is capable of giving an impulse to nutrition which is rarely if ever obtained from the employment of other remedies.
9. That its use is wholly unattended by danger.

On the Use of Ether with Cod-liver Oil.

The same committee (*Ibid.*), from an investigation of the evidence before them felt warranted in drawing the following conclusions :—

1. That the addition of ether to cod-liver oil in about the proportion of fifteen minimis to each half ounce (or an equivalent amount of the compound spirit of ether) will succeed in the vast majority of cases in enabling the patient to take the oil, even though it previously disagreed.
2. That in some cases in which the oil still disagrees after the addition of the ether, the difficulty may be overcome by giving the ether separately from fifteen minutes to half an hour after the oil is taken.

No facts have been laid before the committee having a bearing upon the question as to whether the etherized oil is superior to the plain oil in its ultimate effect upon nutrition, supposing them to be equally well tolerated by the stomach.

Diuretic Action of Squill.

M. DROUOT has studied (*Thèse de Nancy*, 1878) the action of squill on the organism, and particularly on the heart, from a large number of experiments made on animals, and from clinical observations, and has inferred therefrom what the therapeutic consequences of the action will be. In a short historical sketch he shows that there are two principal categories of opinions on the action of squill; one of which maintains that it is a powerful diuretic, and the other, which represents the majority, holds that squill does not exercise any special effect on the kidneys, and only influences the urinary secretion indirectly, by acting upon the heart in a similar way to digitalis. M. Drouot is a warm advocate of the latter opinion, and bases his views on a scientific explanation. The first part of the thesis (*Rev. Méd. de l'Est*, Feb. 15, 1879) contains an account of the author's experiments on dogs and frogs, relating to the action of squill on the heart and circulation. Some of his results confirm the experiments made by Huzemann of Göttingen, while others oppose them. If squill is given in a moderate dose, the

pulsations of the heart and the respiration are accelerated, but the former are less ample, and the blood-pressure sinks considerably. This is the initial stage, which has not been described by Huzemann; it is followed by a second stage, during which the pulse and respiration become slower, while the blood-pressure rises to its normal level. If a toxic dose is given, the blood-pressure rises immediately, while the cardiac pulsations become much slower.

The second part of the thesis is devoted to a clinical study of the action of squill. We gather from it that it is a direct diuretic only in cases of dropsy originating from cardiac disease and in cachexia. Is this result due to the action of squill on the heart? It is probable; because in other dropsies, which were owing to alterations of the liver and kidneys, pleurisy or articular rheumatism, the diuretic action of squill has been found to amount to almost next to nothing
—*London Med. Record*, May 15, 1879.

Effects of Chloroform, Ethidene, and Ether in Blood Pressure.

Drs. JOSEPH COATS, WILLIAM RAMSAY, and JOHN G. MCKENDRICK, of the Committee on Anaesthetics of the British Medical Association, report (*Journal of Anat. and Phys.*, April, 1879) that the facts obtained from their researches seem to them to warrant the following conclusions:—

1. Both chloroform and ethidene administered to animals have a decided effect in reducing the blood-pressure, while ether has no appreciable effect of this kind.

2. Chloroform reduces the pressure much more rapidly and to a greater extent than ethidene.

3. Chloroform has sometimes an unexpected and apparently capricious effect on the heart's action, the pressure being reduced with great rapidity almost to *nil*, while the pulsations are greatly retarded, or even stopped. The occurrence of these sudden and unlooked-for effects on the heart's action seems to be a source of serious danger to life, all the more that in two instances they occurred more than a minute after chloroform had ceased to be administered, and after the recovery of the blood-pressure.

4. Ethidene reduces the blood-pressure by regular gradations, and not, so far as observed, by these sudden and unexpected depressions.

5. Chloroform may cause death in dogs either by primarily paralyzing the heart or the respiration. The variations in this respect seem to depend to some extent on individual peculiarities of the animals; in some the cardiac centres are more readily effected, in others the respiratory. But peculiarities in the condition of the same animal very probably have some effect in determining the vulnerability of these two centres respectively, and they may both fail simultaneously.

6. In most cases respiration stops before the heart's action; but there was one instance in which respiration continued while the heart had stopped, and only failed a considerable number of seconds after the heart had resumed.

7. The use of artificial respiration was very effective in restoring animals in danger of dying from the influence of chloroform. In one instance its prolonged use produced recovery even when the heart had ceased beating for a considerable time.

8. Under the use of ethidene there was on no single occasion an absolute cessation either of the heart's action or of respiration, although they were sometimes very much reduced. It can therefore be said that, though not free from danger on the side of the heart and respiration, this agent is in a very high degree safer than chloroform.

9. These results confirm and amplify those stated in a previous report, to the effect that ethidene does not compromise the heart as does chloroform. By the method of experimentation then employed, the effect on the blood-pressure could not be determined, and altogether the results here obtained are more exact and unequivocal.

It may be added that, since last report, ethidene has been given to a number of patients of all ages, with results which may be described as satisfactory. Given freely at first, it produced anaesthesia as rapidly as chloroform, and the effect could readily be kept up by comparatively small subsequent doses. The only drawback is that in some cases it produced vomiting; but it is not determined that it does so more frequently than chloroform, over which it has the further advantage of producing less excitement, and being more agreeable to the patients.

Iso-butyl chloride was given to three patients, but it produced considerable excitement, and proved an imperfect anaesthetic. It has therefore been abandoned.

Benzoate of Sodium as an Antipyretic and Antiseptic.

This drug is being much used in Germany at present as a prophylactic against diphtheria. The ground for its administration is the fact alleged by GRAHAM BROWN, working in Klebs's laboratory at Prague, that an animal saturated with it could not be inoculated with diphtheritic membrane.

Benzoate of sodium can be taken in doses of ten, fifteen, or twenty grammes per diem without unpleasant effects, even if long continued. It reduces fever less rapidly than quinine and salicylate of sodium, but the effect is said to be more persistent. Klebs (*Prager. Med. Wochenschrift*, iv. Jahr., Nos. 3, 5) has reported a case of diphtheria in a child which appeared to recover under its use, and Lezterich states (*Berlin. Klin. Wochenschrift*, No. 7, 1879) that of twenty-seven cases under his care (three adults, twenty-four children) all recovered but one. Hoffmann (*Berlin. Klin. Wochenschrift*, No. 16, 1879) reports twelve cases of diphtheria (four adults, eight children), all of which ended satisfactorily. The doses given were in the proportion of six grammes daily to a girl of eleven, five grammes to a child of three, and ten grammes to a woman of twenty-five years.

Hoffmann and Klebs have both seen good results from the benzoate in erysipelas. In acute rheumatism Senator has stated that it has succeeded in some of his cases where salicylic acid had failed; but Hoffmann (*loc. cit.*) has seen no good from it whatever, even after doses of ten grammes had been continued for over a week. In chronic rheumatism even Senator has obtained no benefit from its use.

Of other affections in which the benzoate has appeared to be useful, Hoffmann refers to albuminuria, both acute (post-searlatinal) and chronic. In three cases the excretion of albumen diminished remarkably during its exhibition.

Lastly, Petersen (*Centralblatt Med. Wiss.*, No. 10, 1879) relates a case of puerperal fever in a patient of twenty-five which seemed to be hopeless. The temperature was 40° Cent., pulse 140 to 150, and the general condition very bad. He gave at first ten grammes benzoate per diem, and reduced the pulse to 130, with improvement of the symptoms as a whole. With the above dose he at last reduced the temperature to 39.5° Cent., and the pulse to 120, and the patient was able to sleep. On increasing the daily amount to fifteen grammes the effect became decided: the temperature fell to 38.5° Cent., and the pulse to 104, and complete recovery ensued.

We do not lay too much stress on any of the facts just mentioned, but they seem to us at least to warrant a further careful trial of the benzoate in similar and allied diseases.—*Med. Times and Gazette*, May 31, 1879.

The Haematinic Properties of Dialyzed Iron.

Dr. ROBERT AMORY has recently made some very careful observations (*Boston Med. and Surg. Journal*, April 3, 1879) by the aid of Gower's haemacytometer, to determine the influence of dialyzed iron on the globular richness of the blood. An analysis of the clinical history of the five cases in which the observations were made shows that none of them had any organic disease; that they were aware of being out of their usual health; that they were unable to accomplish their regular work; that none had impaired appetite, nor feeble digestion; that three of the four suffered from neuralgia or headache; finally, all had diminished corpuscular richness of blood, varying from 3,350,000 to 4,000,000, and that under the continued use of ninety drops of solution of dialyzed iron per diem this condition of impoverished blood was replaced by an increase in the number of corpuscles, from 3,600,000 to 4,900,000, and the symptoms of ill health simultaneously disappeared with this improvement. We are informed that Wyeth's dialyzed iron was used in these observations.

Physiological Action of Sclerotic Acid.

It was announced some time ago by Dragendorff and Podwitsky that they had succeeded in obtaining from ergot two new principles, *scleromucin* and *sclerotic acid*, and that to these principles the physiological activity of ergot was really due. A good sample of ergot ought to contain from 4 to 4.5 per cent. of sclerotic acid, and from 2 to 3 per cent. of scleromucin. The former substance is an amorphous crystalloid, soluble in water and very dilute spirit, insoluble in absolute alcohol and ether. A few experiments made on frogs appeared to show that sclerotic acid had a powerful effect upon the nervous system. NIKITIN has just carried out a more complete investigation of its properties in Professor Rossbach's laboratory at Würzburg. (Rossbach's *Pharmakologische Untersuchungen*, iii. 1 and 2.) The following are the principal conclusions at which he has arrived: 1. Sclerotic acid exhibits all the physiological and therapeutic actions of ergot, and ought, therefore, to be regarded as its principal constituent. Sodium sclerate is identical with sclerotic acid in its properties, but is somewhat less powerful. 2. Cold-blooded animals are very susceptible to the influence of sclerotic acid. Among warm-blooded animals, carnivora are more readily affected by it than herbivora. 3. The chief action of sclerotic acid is upon the nerve-centres. In frogs, the reflex excitability of the spinal cord is first depressed, then annulled; in warm-blooded animals it is greatly reduced, but never wholly destroyed. 4. The peripheral terminations of the sensory nerves are only paralyzed by sclerotic acid when this is brought into direct contact with them. Neither motor nerves nor striped muscles are affected by it. 5. The heart's action is depressed by sclerotic acid in frogs, but not in mammals, even when the dose is relatively large. 6. Poisonous doses lower the blood-pressure and temperature. 7. The respiratory movements are always slowed; after a lethal dose, they cease before the heart stops beating. 8. The peristaltic movements of the intestine are always accelerated in warm-blooded animals. 9. The uterus, whether gravid or not, is always excited to contraction. Existing contractions are intensified. 10. The haemostatic action of sclerotic acid in pulmonary hemorrhage may be accounted for by its lowering the blood-pressure. Its controlling influence on hemorrhage from the bowel or uterus is due to a different cause, viz., to the anæmia resulting from vascular spasm in those organs. 11. The immediate cause of death in mammals after a fatal dose of sclerotic acid is arrest of the respiratory movements.

The advantages to be anticipated from the substitution of sclerotic acid for ergot in actual practice are: the smaller dose required; the tastelessness of the powder;

its permanence when kept in a dry place. Neither the acid nor its sodium salt are suited for hypodermic administration; for, though they do not appear to set up local inflammation, they give rise to acute pain. The appropriate dose for the human subject may be determined without much risk of accident; for they are from ten to a hundred times less poisonous than the majority of medicinal alkaloids.—*London Med. Record*, March 15, 1879.

Physiological Action of Nicotine.

RENÉ, the author of this interesting thesis (*Thèse de Nancy*, 1878), which has obtained an honourable mention from the faculty of Naney (*Rev. Méd. de l'Est*, No. 4, February 15, 1879), has wisely abstained from traversing too wide a field of researches. He has omitted the action of nicotine on the heart and circulation, and restricted himself to the changes which occur in the nervous and muscular systems after the drug has been introduced into the body. The thesis is divided into three parts, the first is a historical sketch of the different opinions which have prevailed on the effect of nicotine at different times; the second part contains a detailed account of the author's experiments, and the third a detailed analysis of the results he has obtained. One hundred and seventy-two experiments were performed on frogs principally, then on dogs, cats, rabbits, guinea-pigs, mice, pigeons, and a snake. The poison enters the system by every avenue, and always produces quickly the characteristic toxic symptoms. If injected through the veins the effect is as quick as lightning. The statement rather contradicts what has been universally assumed about the slower action of the hypodermic injections or the quicker action of nicotine given as an enema. The immunity which certain animals are said to possess against it has not been proved, but the poisonous dose is not proportionate to the weight of the animal.

The intoxicated muscle loses, almost immediately after it has been pervaded by the poison, the power of contracting when stimulated by the galvanic current; the action of the nerves is also quickly paralyzed. This loss of contractility is due to direct intoxication, not to its having reached the maximum of contraction. The nervous motility is destroyed first and has ceased to exist when muscular contractility still persists, but the intoxication spreads rapidly from the nerve to the muscular fibre. The central nervous system is first attacked by the nicotine; the first symptoms of this excitation are the spasms, which the author describes in a very characteristic way. They consist in a trembling of the whole body very much like that experienced in a violent fit of shivering; it is a vibration of the muscular wavelets; a trembling of every muscle, or rather of every fibre; a series of tetanic shocks, which follow each other closely but are never united in one contraction. This trembling is principally due to an irritation of the cephalic centres rather than of the medullary centres. This is one of the most characteristic differences between strychnine and nicotine. Sensibility is also diminished or destroyed by nicotine, likewise the reflex power of the medulla; if the doses are not very high the non-striated muscles retain their power of contractility longer than the striated muscles.

After small doses the respiration is quickened at first, then it becomes gradually slower, but deeper and stronger, and stops. The expiration assumes the type which follows section of the pneumogastric nerve, this might lead to the inference that one of these nerves has been paralyzed by the action of the drug.

The blood presents a red colouring, which is characteristic of nicotine poisoning, but no particular changes have been detected in it by means of either the microscope or the spectroscope. The spermatozoa become motionless. Bile has no effect on nicotine, which produces the same symptoms, although less rapidly,

after having passed through the system of the vena porta. As yet no antidote has been discovered against nicotine ; strychnia has long been considered as such, but it only adds its own action to that of the former drug, thus rather increasing the effects of the nicotine, or remains powerless if the nerves and muscles are already paralyzed by the poison.—*London Med. Record*, May 15, 1879.

MEDICINE.

Observations on the Subject of Croup and Diphtheria.

Dr. W. H. DICKINSON, Chairman of the Committee which presented to the Royal Medical and Chirurgical Society the recent report on Croup and Diphtheria, terminated the debate which it elicited, as follows :—

I will recapitulate what it is that we suppose ourselves to have made out. First, I must join issue with my respected friend, Dr. Wilks. I never was more surprised in my life than to hear him say that he thought the term "croup" a sufficient and satisfactory definition of a disease. The fact is that croup only names a group of symptoms, it does not define a disease. It includes two most different conditions, which require different or even opposite treatment, and of which one is nearly always fatal, and the other nearly always not so. The most strongly marked distinction which came out in the course of our inquiry is that between membranous and non-membranous affections of the larynx—and both are called croup. Membranous affections of the larynx, be they of what sort they may, are fatal in a proportion of about 90 per cent. We have always known that these affections—whether we call them croup or diphtheria—are very fatal ; but I was hardly prepared for the terrible mortality which our tabulations disclosed. Dr. Gee's table from the books of the Hospital for Sick Children, showed that of sixty-three children affected with membranous inflammation involving the larynx, only three recovered. Ten per cent. of recovery is about the average, and even of this small proportion there are few who survive save with the intervention of tracheotomy. It might be suggested that this exaggerates the danger of the disease, in consequence of the inclusion of *post-mortem* evidence. Membrane was found after death which would not otherwise have been seen, and thus the case was classed as membranous only because it was fatal. If the child had got well, the membrane might never have been found, and the case been placed in another category. But the fact is that we get to much the same result, even though *post-mortem* evidence be entirely excluded. If a child has laryngeal obstruction, and membrane is seen in its throat, the chances are that it will either die or be tracheotomized, and not improbably both. Putting aside all *post-mortem* evidence, one of our tables presented a series of thirty-two such cases, in which membrane was seen during life ; among them were eight recoveries, but only two without the operation. Thus it is clear, however it is viewed, that membranous inflammation of the larynx—without as yet dealing with its possible separation into diphtheritic and non-diphtheritic—is a disorder of extreme deadliness.

We will now turn to another picture. There is a class of cases, not always so readily distinguished from those of membranous disease, in which dyspnoea is often severe and protracted—often so much as to suggest operative relief, but in which no membrane ever comes to light—and which almost invariably end in recovery; not quite invariably, for in a very large recorded experience a case is now and then to be found in which non-membranous croup has ended

fatally. The Hospital for Sick Children provides one such case; Guy's Hospital has given us three; Dr. Johnson has mentioned two in the course of the debate; but these are all the instances which can be got together out of a great field of pathological experience in which croup—using the term in its general sense—has proved fatal without the formation of membrane. Thus non-membranous croup is as remarkable for its favourable issue as membranous croup is for the reverse. It might be suggested that non-membranous croup only differs from the membranous in being a smaller degree of the same sort of change, but there are several reasons which show that the difference is not in degree, but in kind. Many of the non-membranous cases are very severe—as I said, but narrowly escaping tracheotomy; some are long-continued, so that it is not the mildness or shortness of the attack that makes the difference. Then other distinctions show themselves: non-membranous croup attacks boys more than twice as often as girls; it is apt to recur in the same individual, which the membranous disorder is not; it is not attended with glandular swelling—though this distinction is not of great value, as glandular swelling is not necessarily present when the affection is membranous; and lastly, with non-membranous croup the urine is seldom albuminous, with the membranous affection it is albuminous more often than not. In eighteen non-membranous cases in which the urine was examined, it was found to be albuminous but twice; and even this statement exaggerates the frequency of albuminuria in the circumstances, for one of the two in which it was found was a case of somewhat incomplete and uncertain character. To say that albumen was found once in seventeen cases of non-membranous croup would probably be more accurate. But with the membranous affection albumen was found in more than two-thirds of the cases examined—in forty-nine out of sixty-six cases.

Then another and very important difference is to be made out in the causation of each form of disease; non-membranous croup is often definitely traced to a distinct exposure to cold; membranous croup seldom so, if ever. It is often attributed to cold by mothers—they will attribute anything to cold—but the association is never conclusive. On the other hand, we have indubitable evidence that the membranous affection is often produced by infection by foul air or foul water, or some such cause. Allowing, then, that non-membranous croup and membranous croup are distinct diseases, I will come to membranous croup by itself, and thus approach the especial object for which the committee was formed.

The question is, Have we here one affection, always the result of a specific poison, to be called diphtheria, or must we divide the class mainly into two—one diphtheritic and specific; the other, due to common inflammation, to be called membranous croup? I am bound to say that the evidence before us gives us no means of making any such division in the cases which ordinarily come before us. We must fully admit, however, that membranous laryngitis may come on in connection with various other disorders—with scarlatina, measles, smallpox, and others—and that it comes on also as a result of various accidental laryngeal irritations—boiling-water or steam, a cut in the throat, a pea in the larynx, acids, eau de Cologne, and so on; but these cases, whether in connection with the exanthemata or accidental irritants, are few and exceptional. They may conceivably be explained, as Dr. Johnson has explained them, by the chance concurrence of the diphtheritic influence with the fever or accident. But it seems improbable that two separate causes of the same result should thus exactly concur. This is almost the only point in which I personally should not quite go with Dr. Johnson. Dr. Buchanan has calculated how often the various exanthematous diseases should fall together with diphtheria, supposing their concurrence to be a mere matter of chance. He shows that for one quarter of a year, for which he made the calcu-

lation, diphtheria fell with scarlatina about as often as chance would give independently of any pathological association. But the membranous affection fell with measles about twice too often to be thus explained. Dr. Buchanan probably would not attach any conclusive weight to figures thus derived from the bare nomination of the diseases in the Registrar-General's report, but so far as they go they are in favour of the view that certain conditions, apart from the special diphtheritic influence, may develop membrane in the air-passages. I think that the probability is that these febrile and accidental irritants are able themselves to produce the membrane in question. These instances are so few as to be numerically and practically unimportant; however, they are to be considered in forming a theory of membranous inflammation. But the existence of these cases prevents our dogmatizing too absolutely. If we had dogmatized more we should have been more distinct in our conclusions, and should have met more exactly the views of some members of the society. But we thought it better not to dogmatize beyond the dogmatism of nature. But, putting aside such cases as have been mentioned, we look in vain for any ground on which we can further divide the instances which daily occur of membranous inflammation of the air-passages. We cannot find any basis on which we can say that this case is of common inflammation, and that that is diphtheritic. We find no distinction in rough anatomy nor in microscopic. Dr. Barclay says he calls it croup, and regards it as simply inflammatory when the membrane is confined to the trachea. I have no doubt that he means when it is confined to the trachea and larynx [Dr. Barclay assented]. But our tables show instances in which the membrane has been so limited, and yet the disease has been clearly traced to infection, or poison conveyed by air or water. There was an escape of sewer-gas into one of the wards of the Hospital for Sick Children. This caused diarrhoea in some subjects, in one pharyngeal diphtheria, and in another laryngeal diphtheria, in which the membrane was limited, as far as could be ascertained, to below the epiglottis. The child recovered after tracheotomy, so that we had not the warrant of a *post-mortem* examination; but the evidence otherwise was very complete, and the tables give other examples of the same sort. And not only, as shown in such cases, may membranous inflammation of the larynx be produced by causes which set up pharyngeal diphtheria, but membranous inflammation, thus limited, may set up by infection, in another person, the pharyngeal disease—as in the instance Suckling, in one of our tables referred to by Sir W. Jenner. In the next place we have no warrant, as far as causation is concerned, to call some cases simply inflammatory, while others are diphtheritic. We find among these cases many which begin insidiously without ostensible cause; others in which drains, foul water, and insanitary surroundings are apparently responsible; but none in which cold can be, otherwise than somewhat vaguely, ascribed as the cause. Neither can we say that there is any distinction to be made out by the help of albuminuria or by any other test that we have been able to apply. The conclusion, then, is fairly this, that membranous inflammation of the larynx is in a vast majority of cases diphtheritic. The conclusion I believe to be fully warranted by the evidence before the committee; it does not represent the belief (if I may speak of myself personally) that I began with, but I could not resist the evidence which the collected cases presented. To this conclusion there is a corollary which may not be out of place in a society, before all things, of practical medicine. Seeing the difference of issue between non-membranous croup and laryngeal diphtheria, notwithstanding their frequent similarity in symptoms, it becomes of the highest importance, in every case of laryngeal inflammation, to ascertain as far as may be the presence or absence of membrane. I have already referred to the points of distinction, among which albuminuria holds an important place. If

membrane be present and in the larynx, there is little hope but in tracheotomy, which, therefore, there is no reason to delay. But if membrane be not present, the child will almost surely recover without operative intervention, notwithstanding that the symptoms be severe and even somewhat lasting. The operation in such a case can be but a needless and possibly a fatal complication. I should have wished to have said a word, did time permit, upon what was so ably advanced by Mr. Jonathan Hutchinson. No doubt diphtheria is less distinctly isolated than many other diseases, less so than scarlet-fever or typhoid—we have said as much in our report—but it is communicable, and I do not see why it should not be called specific. It has near relations, however, to other disorders, more particularly to one which Mr. Hutchinson especially referred to—follicular tonsillitis, or the spotted throat. This may arise, as we have evidence to show, from the contagion of diphtheria; besides which, it may accompany diphtheria in the same person, the tonsils being spotted, while perhaps there is continuous membrane elsewhere. Then again we have curious evidence that diphtheria may be only one of several disorders engendered by one and the same cause. Of a group of persons who drank of a specially poisonous well—drainage going into it—two had obstinate diarrhoea, one erysipelas, one purulent ophthalmia, one pharyngeal and one laryngeal diphtheria.—*Med. Times and Gazette*, May 17, 1879.

Chloral Hydrate in Diphtheria.

Professor von ROKITANSKY (Innsbruck) has seen excellent results from half-hourly local applications of hydrate of chloral in a 50 per cent. solution in three desperate cases of diphtheria. The pain was slight, and the effect very rapid. As soon as the formation of granulations was observed, weaker solutions of the remedy were gradually exhibited.—*Med.-Chir. Rundschau*, Heft 11, 1879.

Chorditis Vocalis Inferior Hypertrophica.

Professor SCHROETTER discusses (*Monatsschrift für Ohrenheilkunde*, Nov. 12, 1878) this morbid process, which has first been described under this name by Gerhardt. It consists in a swelling originating from the free border of the true vocal cord and bulging into the interior of the larynx, obliterating in some cases considerably its lumen. Cases of this sort have been described by Czermak, Gibb, Türk, Scheff, Burow, Krishaber, Catti, but the views of these and other authors on the nature of the affection differ considerably from each other. Czermak considers the process as a "serofulous infiltration of the mucous membrane," Türk as "chronic tumefaction," Scheff as "hypertrophy," Burow as "chronic inflammatory hypertrophy of the lower part of the true vocal cord," von Ziems-sen calls it "a true induration of the mucous and submucous tissues, originating from hyperplasia of the connective tissue." Catti agrees with Gerhardt's views, Voltolini proposes the name of "inflammatio hypertrophica subvocalis," and Ganghofner consider the process as a part of the disease described by Stoerk, and called by him "chronic blennorrhœa of the mucous membranes of nose, larynx, and trachea." Schroetter does not share in any of these views. Although admitting that the morbid process consists in later stages in a tumefaction or induration of the submucous tissue, he considers that it does not deserve any special name, as the same process has been observed on other parts of the larynx, and, as it is not necessarily a primary one, but is sometimes occasioned, as seen by himself, by primary perichondrial disease. He thinks, however, that this question is at present not to be decided definitely, as no *post-mortem* examination has yet been made in such a case. With regard to treatment, he advises appli-

cation of caustics, of the galvano-cautery, and especially systematic introduction of laryngeal bougies, before the last help, tracheotomy, is resorted to.—*London Med. Record*, May 15, 1879.

Laryngeal Crisis.

Under this name CHARCOT describes (*Gazette des Hôpitaux*, No. 1, 1879) a very interesting laryngeal affection attending on or preceding sometimes for several years the development of locomotor ataxy. It is characterized by a feeling of strangulation and of heat in the larynx; and by a peculiar laryngeal spasm, followed at once by falling down, and by an epileptiform attack. This may repeat itself several times in succession, as soon as the patient has again become conscious. This vertigo is not followed by nausea, and sometimes it is limited to the laryngeal spasm, without being followed by the epileptiform attack. Generally the patient falls forwards. His disease is generally mistaken for cerebral congestion. The entire attack is produced by an irritation of the superior laryngeal nerve (?). Professor Krishaber had examined the case which was shown by Professor Charcot as an illustration of the disease, and had found that the glottis was greatly narrowed, much more than normally. [It is much to be regretted that this statement is not precise with regard to the permanency of this laryngoscopic appearance, because this factor is of fundamental importance for the pathology of the entire affection. If the narrowing of the glottis be permanent in some degree, and this seems to be the case, from Professor Charcot's description, it would appear that the posterior crico-arytenoid muscles, which are supplied by the laryngeal recurrent nerve only, must have been involved in the morbid process. Altogether, the symptoms of the ease described bear so strong a resemblance to those of an undoubted case of paralysis of these muscles, accompanying locomotor ataxy, shown by the reporter in the Clinical Society of London in April, 1878, and recorded in the Society's *Transactions* of the same year, that the reporter cannot help believing that the case shown by the celebrated professor, in illustration of his views on the certainly very rare symptom of locomotor ataxy, on which he lectures, was one of not yet far progressed paralysis of the posterior crico-arytenoid muscles, accompanying the central disease.] Professor Charcot believes that we have no present remedy against these attacks, but thinks they might cease spontaneously.

—*Lond. Med. Record*, April 15, 1879.

Laryngeal Phthisis.

In an interesting clinical paper on this subject (*Medical Record*, May 24, 1879), Dr. F. H. BOSWORTH, Lecturer on Diseases of the Throat at Bellevue Hospital Medical College, emphasizes the following points:—

1st. Laryngeal phthisis may develop from a simple catarrhal inflammation, if there exists an impaired state of health from any cause.

2d. The progressive stages are catarrhal infiltration, catarrhal ulceration, and follicular inflammation, and tubercle plays no part in its primary causation or development.

3d. The disease is far more amenable to treatment than is generally taught, especially if treated in the earlier stage.

4th. Tracheotomy is justifiable as a remedial measure, when local remedies fail to relieve, and before it is demanded by dyspnoea from inflammatory stenosis.

Use of the Carbolic Spray in Catarrhal Affections.

MORITZ has published in No. 1, 1879, of the *St. Petersb. Med. Woch.* an article on the anticitarrhal properties of carbolic acid, of which we give the fol-

lowing abstract. 1. In colds, fresh catarrhs, *i. e.*, when the first symptoms show themselves, such as repeated sneezing, running eyes, a disagreeable pricking feeling in the throat, nose, and eyes, and so forth, it will suffice, according to the author, to inhale a spray of a 2 per cent. solution to cut short the cold. The atomizer is held at about 1½ feet distance from the face, and the patient breathes through the nose five to six times. This operation is repeated every half-hour, till the symptoms have disappeared. Fresh exposure to the cold may bring them on again, but then all we have to do is to repeat the proceedings. 2. In catarrhal complications of measles, the effect of the carbolic spray seems most powerful. The author does not believe that the spray could cut short the measles, but he has derived great advantage from saturating the atmosphere with it. This is done in the following way. Several towels are dipped in a 3 per cent. solution of carbolic acid and hung over the bedsteads of the patients. This must be repeated four or five times daily, and specially during the night. Once or twice during the day the patients must be carried, with their beds, into the next room, for the sake of giving the bedroom a thorough airing. This is continued till the rash has come out fully, and the temperature has begun to sink. When the catarrh is a little better, about the fifth or sixth day of the illness, it is advisable to stop the carbolization. 3. Whooping-cough. It is said that inhalations of carbolic acid have proved useful; the author, however, gives the preference to disinfecting the air as above with cloths and towels. It seems as if the course of the cough were shortened by it. The only drawback is the occasional occurrence of pneumonia, which, however, has never been known to end fatally. 4. Infectious spring catarrhs. They must be stopped from the very beginning, with the inhalations. Later on the air must be carbolized during the night, and occasionally during the day. 5. Asthma following an acute or chronic catarrh of the bronchi. Both the spray, and the spreading of a cloth soaked in the carbolic acid solution over the bedstead at night have often given the most surprising results. 6. Subacute catarrhs of the larynx and pharynx, combined with nightly attacks of coughing, such as often occur in children. Cloths hung up at night. 7. Chronic catarrh of the bronchi, with profuse secretion, generally gets better in an atmosphere saturated with carbolic acid, as well as after inhaling it. This treatment has proved unsuccessful in acute catarrhs of the bronchi, pharynx, and fauces, where the parts are very red; the secretion is profuse, and the cough very violent, such as often occurs in stout elderly men, in the catarrh which often complicates phthisis, and in the spasmodic cough of hysterical women. In the latter cases the carbolic acid is apt to cause violent headache.—*London Med. Record*, March 15, 1879.

Case of Calcification of the Lungs.

We take the following interesting account of a rare case from the *Le Mouvement Médical*, March 8, 1879, to which journal it was transferred from the *Gioriale Internazionale*.

A woman, aged 27 years, who was suffering from dilatation of the stomach, following a stricture of the pylorus, died at the Hospital Rodolfi. At the necropsy, the stricture, which had been caused by the cicatrization of a round ulcer, was found, together with the symptoms of advanced marasmus, and a peculiar state of the surface of the lungs. Some portions of the latter were not soft, did not give way when pressed, and presented a blackish appearance, combined with a greater consistency than is usually the case. The parenchyma was rigid, tough, and when pressed with the finger retained the impression; a frothy liquid oozed out of it when transverse cuts were made; this naturally led to the supposition that the parenchyma of the organs was consolidated. It was, however, discovered under the microscope that the connective tissue between the alveoli and

infundibula was not transparent, but contained some needle-shaped calcareous deposits.

The lungs were found to contain about 14 per cent. of inorganic matter, which consisted principally of phosphates of chalk and magnesia. All the other organs, the bones included, were also submitted to a most careful examination; but the kidneys alone presented manifest symptoms of calcification, the calcareous matter being deposited in the urinary tubules.

The etiology of the disease is very obscure, as nothing was known about the former life of the patient. It was therefore supposed that the cause of this extraordinary illness was a chronic inflammatory process in the lungs, and that it was the effect of what Virchow calls calcareous metastasis. At a discussion on the subject, which took place between the professors of the Royal Society of Medicine, Professor Ramberger said that he thought the limestone must have penetrated into the lungs from the outside; but in what way he could not exactly say. The circumstance that the lungs and kidneys alone contained calcareous matter, would lead to the inference that the presence of the latter in the body can only be ascribed to inhalation through the lungs.—*London Med. Record*, May 15, 1879.

Aortitis accompanied by Neuritis of the Cardiac Plexus.

CUFFER records (*La France Médicale*, January 22) the following case:—

The patient, a woman, 45 years of age, was admitted into La Pitié last November under the care of Dr. Pétér. She had suffered for six weeks in the precordial region as if she had "a bar across the chest;" soon the pains radiated towards the neck, the shoulder, and the left arm, and a feeling of numbness extended down this arm even to the little finger. From time to time she had pains in the left jaw, and some difficulty of swallowing about the upper part of the œsophagus. These pains were continuous from the commencement, but with well-marked exacerbations, resembling in every respect attacks of true *angina pectoris*. On examination, the places above mentioned were found somewhat painful to the touch, and the pain was increased by pressure. Upon compression of the vagus and phrenic nerves in the neck on the left side, very severe pain was felt, not only at the point of compression, but also in the cardiac region, especially at the base. Moreover, a peculiar pain was felt on pressure with the finger in the intercostal spaces along the left border of the sternum. Finally, the attachments of the diaphragm on the left side were very painful on the slightest pressure. These characteristic pains became very violent at certain times, and then the stomach became distended, the respiration manifestly impeded, the heart's action excited, and the surface temperature lowered. M. Pétér considers the *continuity* of the pain, with the occasional exacerbations, resembling attacks of ordinary *angina pectoris*, as of diagnostic value and symptomatic of the lesion, which he names *neuritis of the cardiac plexus*, with concomitant *neuritis of the phrenic nerve*. To the inquiry, what gave rise to this neuritis, the answer is inflammation (aortitis) and dilatation of the aorta. There is a very notable bulging of the chest-wall below the left clavicle; percussion here is painful, but, by means of the plessigraph, it can be made out that the aorta in this region measures 9.5 centimetres in width. The origins of the subclavian arteries are raised so that they are felt beating in the neck much more strongly than is normal. There is neither pulsation nor bruit, nor thrill over this prominence. The area of cardiac dulness is increased; there is no evidence of mitral or aortic insufficiency; the only abnormal murmur heard is a soft systolic souffle at the base. There obviously exists aortitis, with dilatation, situated principally in the arch of the aorta. There is tenderness on percussion behind, along the left side of the spine in the dorsal

region. This is looked upon as another sign of aortitis. There is also evidence of pressure on the left bronchus, and the left brachio-cephalic vein. There is almost complete absence of respiration over the left lung, and there is œdema of the left hand. There is but little difference in the radial pulses.

The treatment, which has been attended with so much benefit that the patient thinks herself cured, consisted in the application of flying blisters to the cardiae region, followed by that of permanent cauteries.—*London Med. Record*, May 15, 1879.

Prognosis in Cases of Diabetes complicated with Gangrene.

PEYROT has arrived at the following conclusions (*Thèse de Paris*, 1878; and *Bull. Génér. de Ther.*, March 15) :—

1. The prognosis is always more unfavourable in cases where the affection has not been early recognized, or where it has progressed rapidly, and the patient is very weak.

2. Incisions prove very useful in cases where an inflammatory process exists, but aggravate the condition of the patient if he should be suffering from spontaneous gangrene.

3. Surgical intervention is always useless in furunculous anthrax, but necessary in the diffused form.

4. Large incisions may be practised in cases of diabetic phlegmon without perhaps incurring any great risk ; with the exception that the edges of the wound have a strong tendency to modify. But this plan seldom prevents the wound from healing, and only retards the process of cauterization.

5. In cases of superficial gangrene the patient's life is seldom in danger, and, as a rule, he recovers.

6. Deep-seated gangrene of the extremities is almost always fatal, being the final symptom of the glycosuric condition ; in short, it may be said, that hitherto no case of diabetic pulmonary gangrene has been known to recover, this complication always ending fatally.—*London Med. Record*, May 15, 1879.

Mucous Concretions in the Intestine.

M. HENRI HUCHARD reports an interesting case of intestinal concretions (*La France Médicale*, January 15, 1879). A woman, aged 50, suffered for some time from obstinate constipation, due partly to anaemia, and partly to a fibroid tumour of the uterus pressing on the rectum. After a short attack of diarrhoea, she passed a mass of gray threads which interlaced, and formed a body the size of a pigeon's egg. The filaments were 35 centimetres in length on average, with a breadth of 8 millimetres. They were hollow, resembling cooked macaroni. After the evacuation the patient improved. M. Rémy examined the mass, and described the cords as being longitudinally striated, and unaltered by acetic acid, their nature being, therefore, mucous. This striated structure contained leucocytes, blood corpuscles, deformed cylindrical cells, and oil globules. M. Huchard does not believe, with M. Raynaud, that such membraniform mucous concretions are caused by desquamation of the mucous membrane, but supports the views of M. Debove, that a hypersecretion of the mucus coats the intestine, and, subsequently becoming detached, contracts to form the tubular filaments. The hypersecretion is usually brought on by constipation, not as a rule neurotic. Occasionally the cause would seem to be herpetic, the process then resembling herpetic pseudo-membranous dysmenorrhœa. If catarrhal inflammation be present, it is secondary to constipation.

A Rare Case of Chronic Coprostasis.

Dr. FLECK, of Marienbad, has published in the *Wien. Medicinische Blätter.*, the following curious case of chronic constipation, which he ascribes to some anomaly in the innervation of the intestines. The patient, a Dutchman by birth, was of delicate constitution, but well nourished, and had always been more or less subject to constipation; but for the last two years his bowels had become torpid to a most alarming extent, moving only from five to six times a year. It is true that, in the intervals between these evacuations, the patient passed a very small quantity of hard feces once in six, eight, or ten days, but these motions would hardly amount to the remains of one meal. Two or three days before one of the principal evacuations occurred, the patient began to feel ill, his sleep was disturbed, he was restless, felt disinclined to work, had a very uncomfortable feeling in his back, etc. Then, after a sharp attack of colic, he passed an enormous quantity of horribly offensive feces; then he felt better for two or three hours, when some more feces were passed, and so on till he had had four or five motions during the day. On the following day, he only had a slight attack of diarrhoea, after which his bowels relapsed into their usual torpid state; but he felt so wretched and exhausted for several days afterwards, that he dreaded the evacuation more than the coprostasis. At the examination, it was found that the feces were principally accumulated in the ascending and transverse colon; these intestines could not only be felt, but also seen through the abdominal walls; the abdomen was soft, not much distended; the diaphragm was pushed upwards; all the other organs were perfectly normal. The patient had tried every possible remedy to cure himself of this affliction, including electrotherapy, hydrotherapy, and very voluminous enemata, but had never succeeded in obtaining relief. He had at last come to Marienbad, where he drank the water and took baths; the result of which treatment was, that the bowels moved once in two or three days. The author tries to explain this curious fact by some anomaly in the innervation of the intestines, owing to which they remained torpid till stimulated by some unknown cause, or perhaps through a reflex act, when the accumulated feces were suddenly expelled.—*British Med. Journal*, April, 1879.

Hedysarum Gangeticum in Dysentery.

Assistant-Surgeon AMRITO LALE DEB writes in the *Indian Medical Gazette* for March: I am desirous to bring to notice the medicinal virtues of the root of *hedysarum gangeticum* in the treatment of dysentery. Within the last three years I have tried this medicine in numerous cases, and I am fully convinced of its efficacy in dysentery. The plant from which the root is obtained enters into the composition of our *Doshomool Panchon* (decoction of ten herbs), which has been in use in the treatment of fever from a very remote period by native *koberrajes*. But the use of the root in dysentery is not mentioned in any of the works on Hindoo medicine, so far as I am aware. The mode of administration of the medicine is simple enough. The root in its fresh state is ground down to a pulp on a curry stone with a little water, and may be given three or four times a day, or every four hours, as the case demands, in doses varying from 30 to 40 grains each time, in adults. It does not produce nausea or any unpleasant sensation on the system. Under its use the motions become feculent, blood and slime disappear, tormina and tenesmus subside, and the patient is gradually restored to health. It is perfectly innocuous, and can be safely given at all ages. In point of medicinal virtue it stands next to *Ixora coccinea*; is especially adapted to acute dysentery of moderate severity. In severe cases, the administration of an open enema is requisite, conjointly with the internal administration of the remedy.

I am led to think that, under the use of this valuable indigenous drug, the number of chronic cases will become rare among the natives of this country, and that it will consequently reduce human suffering and the high rate of mortality. Its Bengalee name is *Salpany*. It belongs to the natural order *Leguminosæ*. It grows wild in many parts of Bengal in the rainy season, but can only be found sparingly at other seasons, when cows graze upon it and the branches and leaves are lost by which it can only be distinguished. However, it can be had to any extent and at all times of the year, especially by cultivation. I would earnestly recommend its use in all the hospitals and in private practice in suitable cases, and should its remedial virtues be proved beyond any doubt by professional men, by giving it a fair trial, it will be a valuable auxiliary in the treatment of dysentery.—*London Med. Record*, May 15, 1879.

On Chronic Bright's Disease, and its Essential Symptoms.

Dr. F. A. MAHOMED, Medical Registrar to Guy's Hospital, has recently published in the *Lancet* an interesting article on this subject, and his views are briefly summarized (*Lancet*, March 29, 1879) in the following propositions:—

1. Albuminuria, though occasionally produced by other causes, is generally the result of increased pressure in the capillaries of the kidney, either venous or arterial.
2. Neither albuminuria nor dropsy are usually present in chronic Bright's disease; when present they indicate acute or epithelial changes.
3. The blood-condition which produces the high arterial pressure of Bright's disease is the primary condition, and is not secondary to deficient renal exertion, as held by Bright himself, and subsequently by nearly every authority upon the subject.
4. The most generally accepted account of the disease and its symptoms fails to recognize it in by far the larger number of cases in which it exists.
5. Cases present themselves wearing the aspects of various forms of heart disease, of bronchitis, of cirrhosis, of cerebral disease, and many other conditions, in which we can only discover the existence of chronic Bright's disease, as the *fons et origo mali*, by the signs of high pressure in the arterial system.
6. The cardio-vascular changes, when found alone, may be taken as evidence of the existence of the disease.
7. Similar changes to those found in the kidneys exist also in the mucous membranes, in the skin, and in other parts.
8. The condition of high pressure is almost constantly present in old age, and, in one form or other, brings about a large proportion of the deaths in persons over fifty.
9. The existence of high arterial pressure in the pulse of young persons indicates a diathesis, and is of grave importance.
10. The same condition, being of frequent occurrence, after the age of fifty is not of such great importance, unless present to an extensive degree; it then produces serious symptoms, and calls for active treatment.

Of these propositions, Nos. 6 and 7, and in great measure No. 3, have been already enunciated by Sir Wm. Gull and Dr. Sutton.

Case of Paralysis of the Ulnar Nerve.

The following fact is published by SABOURIN in the *France Médicale*, February 8, 1879: The patient, C. L., æt. 27 years, entered the Lariboisière Hospital as out-door patient, complaining of an affection of the left arm. He said that two days previously, on waking in the morning, he found that his left arm was, as he supposed, paralyzed. He could not exactly say in what position he

had been lying when he awoke, but stated that he always went to sleep with his head on his right arm. The arm was also entirely anaesthetic ; the patient did not suffer in the least, but could neither extend nor bend his hand or his fingers, which were stiff, and fixed in a particular position. He did not apply to any doctor, but the next day he could move his wrist very slightly, and with great effort. The day after that he made up his mind to go to the hospital, although he said that he already felt much better. On being carefully examined, it was found that the whole of the left arm was perfectly free in all its movements, the forearm was a little bent, but not much, and no stiffness could be felt in the elbow-joint. The axis of the hand was on a line with that of the forearm, the member itself being in a position between pronation and supination. The fingers were a little bent in all their joints, and all at the same angle. The peculiarity which was most striking in the member was the rigidity of the hand and the fingers, which might have been compared to the stiffness of a corpse. The flexor tendons were very prominent on the anterior surface of the wrist. At first sight nothing suggested paralysis ; on the contrary, the phenomenon might rather be called a contraction of all the muscles of the forearm and the hand, the latter remaining absolutely fixed in its position when the forearm was moved by force. No trace of any traumatic affection could be discovered on the arm, neither was there anywhere tenderness on pressure. The hand and forearm were completely insensible to pain, while the sensibility of the upper part of the arm, from the elbow-joint upwards, was normal. The patient being asked to move his hand, made such violent efforts that the perspiration streamed down his face, and at last succeeded in bending the dorsal surface of his hand towards the arm, to an angle of about 45° . The efforts being continued, he could stretch his fingers a little, but both the hand and fingers did not remain long in that position, and gradually returned into the former one. Flexion of the hand and fingers proved still more difficult at first, though the patient succeeded at last. It was impossible to stretch the fingers, and wrist could only be moved with great difficulty. The faradic current having been applied to the extremity, it was found that the electric contractility of the muscles was the same all over the arm, the contractions being perhaps a little feebler on the forearm. There was nothing in the previous history of the patient which might have thrown light on the origin of this extraordinary affection, neither syphilis, alcoholism, nor overwork, etc. The patient was ordered to rub his hand and forearm repeatedly. When he again presented himself at the hospital, a few days later, he was much better. Sensibility had been restored to the whole of the forearm, the hand, and the fingers, with the exception of the fourth and fifth fingers and the corresponding parts of the carpus and metacarpus. All the movements of the forearm and the hand could be executed, but very slowly only ; the patient could, however, use his thumb, forefinger, and third finger. He was then faradized and sent home. A week later he came back, almost well, the movements of the little finger alone being perhaps a little feeble and slow. He has not been heard of since.—*London Med. Record*, May 15, 1879.

Case of Rare Vaso-Motor Disturbance in Leg.

At a late meeting of the Clinical Society of London (*Lancet*, April 26, 1879), Dr. ALLEN STURGE read notes of a case of rare vaso-motor disturbance in the leg. The patient, a man aged twenty-nine, began to have attacks of redness and swelling, with a feeling of heat, in the right great toe about four years ago. They came on after he had been standing some time, lasted for two or three hours, but went off more quickly if the foot were kept elevated ; they increased in severity, and eventually reached the thigh and buttock. Eighteen months after the first onset the burning felt when the foot was put to the ground obliged the patient to give up work. The left foot and leg have begun to feel hot during

the last six months. The attacks are brought on by hanging the leg down, sitting near the fire, wrapping it up warmly, or by much excitement. When first admitted to the Royal Free Hospital he rarely passed twenty-four hours without an attack. For more than two years the right leg had been wasted. The circumference of the right thigh was one inch and three-quarters less than that of the left; that of the right calf one inch and a quarter less. There was marked increase in the reflex irritability of the muscles. Their electrical reaction was altered; there was great diminution of reaction to both constant and induced currents when the rheophores were applied to the muscles, but when to the nerves both currents produced good reaction. Now in atrophy from disease of the spinal cord there would be loss of reaction to the induced current in both portions, and to the constant current when the rheophores were applied to the nerves, and good, or even increased, action when they were applied to the muscles. The surface temperature, taken by Stewart's surface thermometer, was below 75° (the lowest point in the scale); in the attack it was about 93° , always lower on the dorsum than on the sole. Dr. Sturge remarked that this belonged to a class of cases of which a description was published by Dr. Weir Mitchell in the *American Journal of the Medical Sciences* for July, 1878. Dr. Mitchell had seen five cases, and quoted six from other sources. He states that the disease nearly always occurs in men, following some constitutional disease, or after much walking. It begins usually in the ball of the foot, and gradually extends to the rest of the limb. The cause of the disease described by Dr. Mitchell much resembles that above given. Two of his cases were associated with spinal symptoms, such as weakness of the legs, atrophy of muscles, etc. But Dr. Sturge pointed out that in this case the atrophy was shown by the electrical reaction to depend on a local rather than a spinal cause. He suggested that the disease had been brought on by the prolonged over-excitation of the vaso-motor centre, resulting from long exposure of the feet and legs to wet and cold, and that the conditions were allied to the irregular action excited in other centres from over-work, as in writers' cramp.

Dr. S. MACKENZIE had now under care a similar case. The patient, an engine-driver, had suffered with attacks of pain and heat in the foot, the veins of which swell up, and he is quite exhausted after walking only half an hour. The affection had lasted over two years, and was probably induced by the different temperature to which his extremities were exposed as compared with the rest of the body. At first Dr. Mackenzie thought the case one of disease of the spinal cord, for the muscles were wasted; but there was good tendon-reflex, and at length he concluded it fell under the head of the cases described by Dr. Weir Mitchell. He had no doubt that it frequently occurred, but that its true explanation had hitherto been wanting.

Dr. POORE said that the theory advanced by Dr. Sturge was that the phenomena were due to the over-stimulation of vaso-motor nerves, and his comparison of this to the over-stimulation of muscle in writers' cramp was interesting. In writers' cramp and allied disorders it was common to find considerable evidence of vaso-motor disturbance, people with over-fatigued muscles often complaining also of heat and cold in the affected limb. The electrical condition of the muscles was the same in the cases referred to by Dr. Sturge, and in the "fatigue diseases," showing a slight diminution in their irritability, whilst the reaction of the nerves was about normal. He asked if there were any hyperesthesia, nerve-tenderness, or sign of neuritis in Dr. Sturge's cases.

Dr. STURGE, in reply, said Dr. Mackenzie's case fell under another head, amongst the class of cases described by Weir Mitchell, than his own, there being less vascular dilatation. There was no hyperesthesia or tenderness over the nerves of the limb.

SURGERY.

Report on Pyæmia.

The concluding meeting of the Pathological Society of London for this session was signalized by the presentation of the report of the Committee appointed to inquire into the nature, causes, and prevention of the infectious diseases known as pyæmia, septicæmia, and purulent infection. The report may be said to have fallen under the three heads of etiology, semiology, and pathology. In inquiring into the first of these subjects, the committee collected statistics from ten large London hospitals during the past ten years, and from the facts thus gathered have drawn some interesting deductions as to the prevalence of pyæmia and septicæmia in relation to other diseases, to meteorological conditions, and other influences capable of being regarded as predisposing causes. Broadly distinguishing between septicæmia and pyæmia on the recognized ground of the absence in the one and presence in the other of metastatic suppuration, the committee directed their attention to the subject of artificial septicæmia, with the endeavour to ascertain whether any cases of septic poisoning occurred in the human subject at all comparable to those rapidly fatal examples of blood-poisoning produced by the injection of septic fluids in animals, with which the lectures and experiments of Dr. Sanderson have made us familiar. By a calculation confessedly only approximate the committee believed that instances of this form of septicæmia, which they term "septic intoxication," would require for its production the entrance of as much as two or three ounces of putrid serum into the blood at one time. For so large a dose to be absorbed, not only must there be opportunity for the accumulation of fetid discharge, but there must be a large surface for its absorption. These two conditions obtained in the two cases of septic intoxication they report, and they suggest that had cases of rapid death after ovariotomy been included they would have had more instances of this, the most deadly form of septicæmia, owing to the large absorbing surface presented by the peritoneum. The morbid changes present in this form of septicæmia much resembled those in the more usual form, that known as septic infection without metastatic abscesses—fluidity of blood, subserous hemorrhage, and softening of spleen being the chief of these. So far as could be gathered, the effects of ordinary septicæmia, that of infection from one patient to another, were the same as those produced by the rapid septic intoxication, only spread over a longer interval, but, as Koch first showed, there is an integral difference between them. In all cases of septic infection organisms may be detected in the blood. Twenty-nine cases of septicæmia were detailed in the report, of which only two were instances of septic intoxication. There remained 127 cases of pyæmia, the ordinary significance of the word being used by the committee, who, however, have succeeded in making no fewer than eight subdivisions of this form of blood-poisoning. These subdivisions are based mainly upon the relations of thrombosis and softening clots to secondary abscesses, and upon the situation of these abscesses (*e. g.*, in some cases they were absent from the lungs, in others these organs alone contained them, and so on), whilst pyæmia due to acute necrosis and that due to ulcerative endocarditis each occupy a place apart. One very constant fact is striking, namely, the association of "arthritic pyæmia" with genito-urinary inflammation. This is of interest in connection with gonorrhœal rheumatism, and possibly also with rheumatoid arthritis. Details of the examination of the blood and urine completed this section of the report. It is interesting that in nearly all of the eighteen cases of pyæmia and septicæmia in which the blood was examined, bacteria were found, but by no means in constant

proportion nor in any constant uniformity of size and shape. The committee could not then propound any theories from these observations. They have wisely contented themselves with stating the facts. They could not even trace relations between the different forms described. It does not appear that any "cultivation" of them was followed out. But with the facts before them, they were justified in believing that the presence of these organisms was rather evidence of the existence, than cause of the production, of the symptoms of blood-poisoning. Many considerations naturally arise here, but until the subject can be viewed in all its bearings, until the report is fully before us, it would be out of place to attempt anything like a criticism. The most interesting fact yielded by the analysis of the urine was the diminution in the excretion of inorganic constituents, chiefly earthy phosphates. It was suggested that this might be due to consumption of these constituents in the blood by these organisms. It was also pointed out that the potash salts were not in excess, as had been theoretically surmised might be the case.

The question before the committee was one of unusual difficulty, and great credit is due to them for having produced so voluminous and so exhaustive a report within the brief space of eighteen months. It will be found when it comes to be published to be the most complete survey of the subject of pyæmia and septicaemia in man that we possess, and it will prove valuable, quite as much for the suggestions it affords for further research as for the new light it has thrown upon the nature of these diseases.—*Lancet*, May 24, 1879.

Typhoid Fever and Periostitis.

Until the present time the relations between the inflammations of the periosteum and typhoid fever have not been much studied. Knowing that abscesses, myostitis, suppurating infarcta of the intestines, etc., are caused by the effect of typhoid fever, why should we not admit that the bones and their covering may be affected like the rest of the tissues in this illness? MERCIER (*Rerue Mens.*, January, 1879) has observed this complication in seven cases. It comes on during convalescence, *i. e.*, after five or six weeks of illness, when there is no fever, and the patient begins to get up. The most marked symptom of this periostitis is weakness, which increases, in spite of the good appetite and the normal state of the digestive functions, the tonics, and nourishing food. Generally a member feels at this time heavy, impotent, and benumbed, the leg can hardly sustain the weight of the body, or the movements of the arm and shoulder are limited. The periosteum is swollen and very tender to pressure in some spots. From four to eight days later the patient complains of violent pains; the skin is normal, but the subcutaneous cellular tissue has become œdematosus; the periosteum is tumefied, thickens, and grows excessively painful. This tumefaction of the cellular tissue lasts for four or five days, when the symptoms begin to decrease. The pus which has been formed is either reabsorbed or evacuated. In this case the pains cease, and the periosteum remains thick, sometimes the periostitis ends in necrosis of the bone. It is only after these inflammations of the periosteum are entirely over, after the pus has been either reabsorbed or evacuated, that the patient begins to gain flesh and recover his forces, and the illness may be said to be terminated. The etiology of this complication is as yet very obscure, as it seems to come on suddenly, at least apparently so, unless some traumatic affection in some part of the body seems to determine the spot where it will break out later on. So far as the treatment is concerned, the author has found that a blister applied to the tumefied point from the very beginning has proved useful. When the pus has formed, no artificial opening must be made to evacuate it, as this

might give rise to septicæmia; therefore it is better to let the pus either be reabsorbed or spontaneously evacuated.—*London Med. Record*, May 15, 1879.

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The Influence of Antiseptic Treatment on Injuries of the Head.

A paper by Prof. ESTLANDER of Helsingfors, published in the first number of the *Nordiskt Medicinskt Arkiv* for 1879, contains valuable testimony to the beneficial influence of the antiseptic treatment. During the eighteen years 1860-1877, three hundred and forty-one cases of injury of the head were admitted into hospital, under his care. He divides these into two series: one, from 1860 to 1869, in which the ordinary treatment was followed; and another, from 1870 to 1877, in which carbolic acid was used. The results are briefly as follows. In the first period, there were one hundred and forty-five cases: viz., simple wound, seventy-nine recoveries and three deaths; wound laying bare the skull, thirty recoveries and seven deaths; wound with fracture of the skull and lesion of the brain, three recoveries and seven deaths; fracture of the base of the skull, four recoveries and four deaths. In the second or antiseptic period, the numbers were: simple wound, ninety-two recoveries and three deaths; wound with exposure of the skull, sixty-six recoveries and one death; fracture of the cranium and injury of the brain, eleven recoveries and two deaths; fracture of the base of the skull, six recoveries and five deaths. Six cases are deducted in the first period and ten in the second, because death occurred too soon after the admission of the patients for the influence of any treatment whatever to be apparent. It will be seen that the difference in favour of the antiseptic treatment is strongly marked in the case of wounds attended with exposure of the skull; the mortality in the first period being seven cases in thirty-seven, or very nearly 19 per cent.; in the second, one in sixty-seven, or about 1.5 per cent. In the cases attended with injury of the brain, the difference is also great: in the first period, three-fourths of the patients died; in the second, about one-sixth (two in thirteen) recovered. These results are more striking, when it is observed that the death-rate in fracture of the base of the skull, where, of course, antiseptic treatment is inapplicable, was very nearly the same in the two periods. Dr. Estlander says that the results of the antiseptic treatment correspond with his experience of injuries of other parts of the body. Before adopting the antiseptic method, he lost sixteen out of thirty-one cases of compound fracture of the bones of the limbs, and six out of ten cases of penetrating wound of the knee; while, since he has used antiseptics, he has had sixty-six cases of compound fracture with nine deaths, and twelve cases of wounded knee with two deaths.—*Brit. Med. Journ.*, May 31, 1879.

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Salivary Tumour, following the Extirpation of a Tumour of the Parotid Gland.

At a meeting of the Société de Chirurgie on January 8, 1879, M. MARTINET read the following note on an unique case. A lady aged 28 had for some time suffered from a tumour of the parotid gland. M. Martinet operated upon it, enucleating the tumour, which resembled adenoma. The patient was ordered to maintain complete silence, and to avoid mastication. On the tenth day, thinking she was out of danger, because the wound was cicatrized, she bit into a piece of bread. Immediately her cheek swelled very much, and the tumour reappeared on the same spot as before. M. Martinet, on examining it, found that it was soft and fluctuating. He made an incision, and a few drops of pus and saliva came out of it. On the patient being told to masticate, the tumour formed again. She was again restricted to taking liquid food, and injections of carbolic acid were made into the sac. On the next day the carbolic acid was found to enter the

mouth. It had passed through the ductus stenonianus. On the twentieth day the patient was well, and the wound was closed.

This case seems to be the only one recorded. We must especially notice three points—the sudden formation of the fluctuating tumour, the communication between it and the ductus stenonianus, and, lastly, its rapid healing. This was due to the cessation of the flow of the saliva into the cavity, caused by the obliteration of the opening through which the saliva penetrated into the cavity, the obliteration of the cavity itself, and the ductus having again been opened by the injections, so as to allow the liquid to pass through.—*London Med. Record*, March 15, 1879.

Removal of a Biliary Calculus from the Gall-bladder.

At a recent meeting of the Clinical Society of London (*Lancet*, May 24, 1879) Mr. THOMAS BRYANT read the note of a case in which a biliary calculus was removed by operation from the gall-bladder, and a cure resulted. The patient, a single woman aged fifty-three, was admitted into Guy's Hospital in July, 1878, with two discharging sinuses of three years' standing, following an abscess, which had been previously forming for two years. At first the sinus was laid open, and pus alone escaped; but, subsequently, as bile flowed in quantities from the wound, an exploratory operation was performed, and at a depth of two inches a biliary calculus an inch long turned out of the gall-bladder. Everything went on well after the operation, and although bile continued to escape from the wound for about two weeks, the parts quite healed in about four months, and the patient left the hospital cured. Mr. Bryant brought the case before the Society as an encouragement to surgeons to apply their art in similar or allied cases, for he was well prepared to support the suggestion of Dr. Thudichum, made twenty years ago, "that gall-stones might be removed from the gall-bladder through the abdominal walls;" and he pointed out that under certain circumstances the operation was justifiable, when the sinuses by their presence were setting up inflammatory and suppurative changes about the gall-bladder, without any obstruction to the bile-ducts, as well as in that more serious class of cases in which the cystic or common bile duct was obstructed, and dropsy of the gall-bladder, with jaundice, complicated the case, as shown by the cases of Dr. M. Sims and Mr. G. Brown. Mr. HULKE said there could be no doubt as to the propriety of the operation. In the *Mémoires de Chirurgie* for 1706 was an interesting and exhaustive treatise upon these cases, in which the whole question of diagnosis was very carefully gone into, where a similar case to that of Mr. Bryant's was related, and where a clear and nice comparison was made between this operation for the removal of gall-stones and lithotomy.

Renal Cyst mistaken for Ovarian; Extirpation of the Kidney; Recovery.

The *Hospital Gazette* (March 15, 1879) quotes the following case from *La France Médicale*, No. 99, p. 783. Patient æt. 49, previous history good. Had borne five children to term and two miscarriages. Ten months since she noticed a tumour developing in the left iliac region, which in the last two months had increased rapidly in volume. Patient became emaciated. No albumen in urine. Tumour movable in every direction, 6 by 7 inches in diameter. Fluctuation very perceptible. Diagnosis, ovarian tumour. Operation. On opening abdomen, both ovaries discovered to be healthy. On puncturing the cyst $2\frac{1}{2}$ pints of fluid escaped. Cyst adherent to kidney, which was degenerated in its lower portion. The renal vessels and ureter were tied, and the kidney removed with the cyst; 4 months later recovery complete.

A Rare Form of Intestinal Obstruction due to Invagination of a Portion of the Small Intestine in the Walls of the Rectum; Gastrotomy; Recovery.

At a late meeting of the Clinical Society of London (*Brit. Med. Journ.*, Mar. 8, 1879) Mr. EDWARD BELLAMY communicated the notes of this case. The patient was a pale delicate-looking woman, aged 34, of intemperate habits. She was admitted into the Charing Cross Hospital on February 15th, 1879, with all the symptoms of intestinal obstruction. She had passed nothing *per anum* for nine days prior to admission. She had an inguinal rupture on the left side, and had worn a truss, which was left off just prior to the present attack, and the hernial protrusion did not seem to have come down since. She had been subject to obstinate constipation, and on three occasions the retention of fecal matter had given rise to very serious symptoms. These, however, had always been relieved by ordinary means. On admission, a hard swelling was felt in the left iliac fossa, in the region of the inguinal canal and sigmoid flexure. She had intense pain over the lower part of the abdomen, and her eructation smelt stercoaceous. She was placed under the influence of an anaesthetic, and Mr. Bellamy introduced his entire hand into the rectum, and found that he could not get any fingers past the upper part of the rectum, which seemed to be filled up by some protrusion into it and which itself appeared to be constricted. He, however, determined to wait awhile before operating, and to give the patient all chance of treatment prior to doing so. She, however, rapidly became worse, the vomit becoming absolutely stercoaceous. On the evening of the 19th, strict antiseptic precautions being adopted, Mr. Bellamy first made an incision down to the external ring, thinking that perhaps there might be some implication in the canal. On passing his finger into it, he found that this was not the case, but he did find the sigmoid flexure greatly distended. Having enlarged the incision upwards and obliquely outwards, he was enabled to pass the entire hand within the abdominal cavity and feel for the constriction. Thinking it possible that the sigmoid flexure might have been constricted anteriorly by the posterior utero-vesical fold of peritoneum, he felt for it, and found it not only very much developed, but obscuring a knuckle of small intestines which was obviously invaginated in the anterior aspect of the first part of the rectum, and in addition there was what appeared to be bands of organized lymph, stretching across in the same place, and probably the result of some earlier inflammatory process. (The existence of these bands, and the hypertrophy of the peritoneal fold, would account for the non-reduction of the hernia *per anum*.) Having again introduced his entire right hand into the rectum, Mr. Bellamy pushed the prolapsed mass upwards and towards his left hand, which was in the pelvic cavity, at the same time breaking down the adhesions and gently drawing out the knuckle and small intestine from its invaginated position, and freeing it from the peritoneal fold. Very soon afterwards, flatus was passed, and in a few hours a copious evacuation followed; of course affording immense relief. The patient became very delirious on the fourth day, but the symptoms yielded to morphia and chloral. The wound was treated strictly in accordance with Lister's method, and she had absolutely no bad symptoms till Thursday (26th), when some symptoms of peritonitis occurred. In examining the literature of the subject, the author had been unable to find any case where gastrotomy had been performed for a similar condition, although Lockhart described the form of hernia: but he stated that he had never known operation necessary. It would be concluded, of course, that the cavity of the peritoneum was opened. This was unavoidable from the nature of the adhesions, and the surgeon's examination was made from within its walls.

Mr. Bellamy allowed that the cause of this hernia was inexplicable; the ante-

rior portion of the rectum had given way, the small intestine had got under the meso-rectum, and had then pushed forward under the mucous membrane.

Laparotomy with Antiseptic Treatment.

The *Archiv für Chirurgie*, Band xxiii. Heft 2, contains a report by Professor CZERNY, of Heidelberg, on a series of cases in which laparotomy was performed, with an endeavour, in each instance, to maintain, during and after the operation, an antiseptic condition of the wounded parts. A full description is given of the details of the treatment carried out in these cases, which details differ somewhat from those observed by Lister. Professor Czerny, though holding carbolic acid as an antiseptic superior both to thymol and to salicylic acid, regards it as a double-edged weapon, which should be used with much caution, and especially when the surgeon is dealing with an extensive serous surface. The operating room, after fumigation with sulphur, should be well heated. As soon as the patient has passed under the influence of chloroform, the surfaces of the abdominal walls and of the genitals are well washed and disinfected with a $2\frac{1}{2}$ per cent. solution of carbolic acid. The seat of the operation is then surrounded by compresses dipped in this solution, and at the same time, in order to prevent eczema through prolonged contact from the accumulated fluid of the spray, the back and sacral region are oiled and covered by layers of wadding. The instruments, for some time before they are used, are kept in the $2\frac{1}{2}$ per cent. solution. For sutures the author uses silk boiled on the previous day during ten minutes in a 5 per cent. solution of carbolic acid, and then kept until required for use in a 2 per cent. solution. Silk thus treated is used also for ligatures. The two ends are cut off, and when the wound heals quickly and without suppuration, no irritation is set up by the presence of the noose in the soft parts. The silk ligature remains encapsulated within the tissues, and is not absorbed, as catgut is, which, in some operations, as the radical treatment of hernia and the deligation of an ovarian pedicle, may, according to Professor Czerny, be considered as an advantage. The sponges, having previously been disinfected in a stronger fluid, are placed, on the morning before the operation, in a 2 per cent. solution of carbolic acid. The wound, after the operation, is covered by Lister's dressing, and thick layers of "salicylic wadding," and, over all, a firmly constricting bandage. Compression of the abdomen is regarded as an important detail of the after-treatment, since by this means accumulation within the peritoneal cavity of putrescible exudation may be prevented. In one case only has the author hitherto practised prophylactic drainage of the abdomen in performing laparotomy.

Professor Czerny has practised abdominal section with the above described antiseptic dressings in ten cases. Of these ten operations, six were for ovariotomy, two for hysterotomy, one an incision in a case of suppurative peritonitis, and one an exploration in a case of doubtful abdominal tumour. In one only of these, and that an ovariotomy, was the result fatal.

In two of the instances of ovariotomy, both for cystoma of the ovary, the operation was attended with much difficulty, in consequence of adhesions, and it was found necessary to apply many ligatures. In one of these cases both ovaries were removed. In the second case a long and thick pedicle was first touched with the actual cautery, and subsequently, on account of renewed hemorrhage, constricted by several ligatures. In all the other cases of ovariotomy the pedicle was dealt with only by ligatures. In one case the operation was very easy, since, notwithstanding a previous electrolytic treatment of some activity and duration, no adhesions had formed. The fourth case terminated fatally, though it had presented the most favourable prognosis before and during the operation. On the fourteenth day, when the abdominal wound had closed without any signs

of local reaction or any general affection, save a slight attack of intermittent fever, the patient suddenly became collapsed, and complained of severe abdominal pain. The case was then diagnosed as one of septic peritonitis, and treated by drainage of the peritoneal cavity and injections of thymol-water. After an interval of eight days, during which the patient had been much relieved and the prospects of recovery had been good, death resulted from acute pulmonary congestion, and a second sudden fit of collapse. At the autopsy a large abscess was found between the uterus and the rectum. In two of those cases of ovariotomy the fever after the operation was high, in two others it was slight, and in the remaining two cases there was no rise of temperature.

In the two operations for hysterotomy performed in cases of multiple parietal fibromata exciting profuse hemorrhage, much difficulty was experienced in maintaining an antiseptic condition of the seat of operation, in consequence of an extra-peritoneal treatment of the pedicle, and of the necessity of using for this purpose large and complicated apparatus. In one case a chain *écraseur* was used, and in the other two long needles. In the former case, in which both ovaries were removed, the operation was followed by thrombosis of the left femoral vein, and high fever. In the second case there was but slight rise of temperature. Although in both these instances of laparotomy the antiseptic treatment was so imperfect that the wounded parts could not be well protected from the contact of disinfected air, and extensive necrosis of the pedicle occurred, still decomposition of the exuded fluids was much retarded, and bad smell avoided.

In the ninth case, a large swelling, with a tough and fibrous exterior resembling the wall of a cyst, was exposed during an operation for the removal of a supposed ovarian tumour. On incision of the wall of this swelling, a large quantity of sero-purulent fluid was discharged from a cavity which was bounded above by the stomach and spleen, below by the uterus and bladder, and behind by a mass of united coils of small intestine. The surfaces of all the abdominal viscera were covered by thick and tough exudation. Four large drainage tubes were inserted into the sac of the abscess, and the external wound was dressed antiseptically. Some slight decomposition of the purulent secretion occurred in spite of this treatment, but there was very little fever during the subsequent progress of this case, and the patient ultimately made a good recovery.

The last case was one of a small abdominal tumour in a man who was the subject of right-sided cryptorchism. The growth, which lay in front of the spine, was so very painful that the patient eagerly demanded some operative means of relief. The tumour was diagnosed as being either a degenerated sarcoma of the retained testis, or sarcoma of a mesenteric gland. On exposure of the growth through abdominal section, it was found to be of the size of an ostrich's egg, and presented a white and fibrous external coat resembling the tunica albuginea. It was firmly bound down to the spine and over the aorta by very tough and vascular connective tissue, and over the front of the tumour coursed the flattened ureter from the right kidney. An attempt was made, but without success, to detach this tumour. The patient made a good recovery after the operation, and was much relieved through the cessation of pain in the growth.

Professor Czerny points out that the general results in these ten cases were favourable, although in four he failed to prevent inflammatory irritation and decomposition in exuded fluid. Fever, which is usually very high after abdominal section, was very slight in four of the cases, and altogether absent in three cases. In not a single instance were any symptoms observed of primary septic peritonitis. The hygienic condition of the hospital in which these operations were performed is reported to be very good, but still the results, from their exceptionally favourable character, have convinced Professor Czerny of the importance

of always relying on antiseptic measures in the performance of laparotomy, and during the after-treatment of the external wound.—*London Med. Record*, April 15, 1879.

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Acute Intestinal Obstruction; Laparotomy; Removal of large Impacted Gall-Stone from Ileum; Death from Peritonitis.

At a late meeting of the Clinical Society of London (*Brit. Med. Journ.*, Mar. 8, 1879) Mr. THOMAS BRYANT read the notes of this case, which was one of a lady who had been in good health, having no symptoms of disease, except indigestion from time to time. On August 8th, she went to bed in health, and awoke at 12 o'clock with sickness and severe abdominal pains. She was thought to be suffering from a bilious attack, but the symptoms persisted. The attacks of pain became more and more frequent, and the vomit first foliaceous, then stereoraceous. During the exacerbations of pain, she writhed in agony. The abdomen was everywhere tympanitic and tender; but the centre of distress seemed to be on the left of the umbilicus. The countenance was anxious, and pulse feeble; there was no external hernia. The diagnosis was that of acute intestinal obstruction, and pointed to a band, or twist, on an internal hernia; but there was no history to confirm any particular view. It being evident that death must ensue without surgical interference, laparotomy was proposed. *Operation.*—A downward incision, four inches long, was made in the central line of the abdomen, commencing at the umbilicus; blood-stained serum escaped, and the small intestines were found to be eehymosed. The coils of intestine were followed, and a hard ovoid body was found impacted in, or rather grasped by, the intestine. The body, which proved to be a gall-stone (exhibited before the Society), was removed; the wound in the intestine was stitched with earbolized catgut, and the bowel returned. The patient never rallied from the collapse, but sank in eight hours. At the *post-mortem* examination no extravasation from the wound in the intestine had taken place. On the contrary, it was well sealed with lymph. There was advanced peritonitis. The point of impaction was in the ileum, one foot above the ileo-caecal valve; the gall-bladder was a thickened pouch, about the size of a walnut; the duodenum was adherent to it, and their cavities were continuous. The gall-stone removed weighed 238 grains, and measured $1\frac{7}{8}$ inches in length, $1\frac{1}{2}$ inches in breadth, and $3\frac{1}{4}$ inches in circumference. Mr. Bryant remarked that the gall-stone must have made its way into the duodenum by ulceration, without any symptoms, more than could be attributed to indigestion. He commented upon the advisability of not delaying operative interference in cases of recognized intestinal obstruction, and mentioned that probably success did not follow the operation in question because it was performed at too late a period; seventy-two hours of acute obstruction, together with mechanical injury of the calculus, giving rise to acute peritonitis, which rendered success almost impossible.

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Double Perforation of Intestine successfully treated by Catgut Suture.

Dr. RIEDINGER, of Würzburg, relates the following case in the *Centralblatt für Chirurgie*, No. 10, 1879. In operating for strangulated inguinal hernia on a man aged 35, a large quantity of fluid having an offensive smell escaped from the sac; and, on examining the intestine, which was much injected, and of dark brown and in some parts black appearance, two rather large ruptures were found in the posterior part of the loop. After removal of the sloughing edges, these were united by a series of catgut sutures placed close together. The united wounds lay parallel with the long axis of the gut. Care was taken to bring the serous surfaces into intimate contact; the sutures were carried through the entire thick-

ness of the bowel. The intestine was replaced, and Listerian dressing applied, a drainage-tube being inserted. Healing took place in a short time, without febrile disturbance.—*British Med. Journal*, April 19, 1879, from *Deutsche Medicin. Wochenschrift*, March 1st.

The Cure of Hemorrhoids by the Hypodermic Injection of Carbolic Acid.

MR. EDMUND ANDREWS, Professor of Surgery in the Chicago Medical College, has recently made (*Chicago Med. Journal*, May, 1879) a laborious inquiry into the results of over 3300 cases treated by this method, reported to him by about 300 physicians. From a study of these cases he deduces the belief that, if the following rules be observed, the method of treatment by hypodermic injection will be less painful than any other, and equally safe:—

1. Inject only internal piles.
2. Use diluted forms of the remedy at first, and stronger ones only when these fail.
3. Treat one pile at a time, and allow from four to ten days between the operations.
4. Inject from one to six drops, having smeared the membranes with cosmoline to guard against dripping. Inject very slowly and keep the pipe in place a few moments to allow the fluid to become fixed in the tissues.
5. Confine the patient to bed the first day, and also subsequently if any severe symptoms appear. Prohibit any but very moderate exercise during the treatment.

His final conclusion is that this mode of treatment is a valuable contribution to scientific knowledge, and that the cautious injection of hemorrhoids with carbolized solutions will remain as one of the permanent operations of surgery. The operation is to be performed in the following way: The pile is exposed to view, and the anus smeared with an ointment to prevent smarting in case the fluid should chance to drop. The operator then takes a sharp-pointed hypodermic syringe, charged with the carbolized liquid (which has been used in varying strength from one part of the crystallized carbolic acid to thirty of olive oil or glycerine up to equal parts), and slowly throws a few drops into one of the piles. The pipe is left in the puncture a few moments to prevent the fluid from running out, and to allow it to become fixed in the tissue. The pile turns white, and in the most successful cases withers away without pain, suppuration, or sloughing. Only one pile is treated at a time, and about a week is allowed between the sessions, until all are cured. Most of the cases thus operated upon suffer a sharp temporary smarting, and a few have a terrible and prolonged agony. The majority are cured, however, without interrupting the patient's business.

Symptoms and Treatment of Cystitis of the Neck of the Bladder.

LAFOREST, after having carefully studied the different forms of cystitis of the neck of the bladder and their symptoms, sums up his results as follows. (*Thèse de Paris*, 1878; and *Bull. Général de Thérap.*, March 15, 1879.)

There are three different forms of cystitis of the vesical sphincters, according to the symptoms. They arise from different causes, and must be treated in different ways. The first form, which is most frequently met with, is comparatively the least troublesome one. It generally lasts from forty to sixty days, and is called "subacute cystitis of the neck." The treatment consists in most cases of simple therapeutical means, though the use of soft bogies will prove very efficient towards hastening the recovery of the patient. A second form of the affection is apt to cause much pain and trouble, owing to frequent attacks of spasms

and contractions, which give rise to alternate fits of retention and incontinence of urine ; while, at the same time, the desire to micturate becomes so frequent, as to cause the patient serious inconvenience, and disturb his rest. This affection lasts generally from six weeks to several months ; the author has given it the name of " chronic cystitis, complicated with spasms and contractions." Owing to the fact that it is always brought on by inflammation, this form of cystitis may easily be cured during its earlier stages, but a purely medical treatment will hardly prove efficient enough alone, unless combined with surgical treatment. According to the severity of the case, either progressive dilatation or divulsion, or a local application of nitrate of silver, or even internal urethrotomy, may be successful. The third class has been simply named " rheumatic or nervous cystitis," as its etiology is very clear ; neither urethritis nor blenorragia are present, only a purely rheumatic diathesis. Its duration is from three to six months, but cases have come under observation where it lasted for years ; and, finally, ended fatally. The treatment must be a very energetic one ; it generally consists in divulsion, internal urethrotomy, and even median lithotomy.—*London Med. Record*, May 15, 1879.

Deligation for Aortic Aneurism of the Right Carotid and Subclavian Arteries, with a new species of Ligature.

At a recent meeting of the Royal Medical and Chirurgical Society (*Lancet*, May 31, 1879) Mr. RICHARD BARWELL read a paper on this subject, of which the following is an abstract.

Mr. Barwell reminded the Society that he has already rerecorded four cases of double ligature of these vessels, three of which were successful, and pointed out that the same operation was in the present case undertaken not for innominate but for aortic aneurism. As this practice and the ligature used are new to surgery, somewhat lengthy remarks would be necessary, hence the case must be briefly recorded. John S., aged thirty-six, gray and old for his years, was treated by Dr. Green for an aneurism of the aorta which pressed upon the right bronchus, and by the middle of February, six weeks after admission into Charing Cross Hospital, that tube was very nearly closed, and the right lung occluded from the air. On the 15th of February Mr. Barwell tied the right carotid and subclavian arteries with immediate sense of benefit to the patient, who continued to improve, air entering the lung freely until the end of March, when some private news produced great excitement, and shortly afterwards symptoms of dilated aorta about the origin of the left subclavian appeared. These again diminished, so that in the first week of May the man was in a far better state—air entering the right lung—although some disease of that organ had been produced by the previous pressure.

Remarks.—The three large branches of the transverse aorta are not given off at right angles to the trunk, but so obliquely that the distal margin of the orifice of each lies lower than the proximal ; from this distal margin run downward and to the right certain ridges which, acting on the blood-stream, divert the current at that part into each orifice. These ridges divide the upper aspect and a portion of the antero-posterior wall into districts, one for each vessel. A fibrous concretion detached from an aortic valve finds its way, as a rule, into the left carotid—a fact which has given rise to the idea that this vessel lies more in a straight line with the aorta than the right. Mr. Barwell showed the contrary to be the fact—that a probe passed down the left vessel impinges on the aorta near its origin, and that one passed down the right artery enters the heart. He concludes that we can only account for concretions going to the left carotid by believing that on the right of the ascending aorta (the exact part was shown in

diagram) the blood current is more tranquil than on the left of that vessel; the two currents may be supposed separated by a line drawn from the left carotid orifice to the outer aspect of the origin of the aorta. Hence it may be concluded that for aortic aneurisms amenable to operative treatment those that can be diagnosed as arising to the right of this line must be treated by tying the right vessels, those on the left by deligation of the left carotid. The ligature used has been the subject of much care and experiment. Catgut has been shown to be unreliable for tying vessels in continuity; it does not appear that this depends on the method or period of soaking in carbolized oil. The author attributes its defects to the method of manufacturing the catgut itself. Putrefaction in water enters largely into this process; different parts will have suffered in various degrees from putrefaction. But more objectionable even than this is the shape of the ligature, for it is difficult, perhaps impossible, to avoid dividing the inner coats of vessels tied with a round cord. Now, it is this division of the vascular coats that exposes patients to the dangers of secondary hemorrhage, which has been the cause of death in almost every case hitherto recorded of tying the innominate or first part of the subclavian. An organizable ligature, which, being flat, does not divide the arterial coats, ought to secure surgery against this danger. After many experiments the author hit on the idea of using the middle coat of oxen's aorta, which, being quite fresh, is to be prepared by separating it from the outer coat and by cutting it spirally, thus making long flat tape-like ligatures, which are dried under suspension by a weight to remove superabundant elasticity. Just before use they are moistened to restore flexibility. Before attempting operative surgery with this material it was tested experimentally in various ways, and in the case recorded its action left nothing to be desired. If the anatomical and physiological views propounded in the first part of this paper are correct, a precision, as yet wanting, will have been given to operative procedures in cases of aneurism, while by the new ligature a degree of safety hitherto unattained will have been imparted to the operations themselves. At the conclusion of the paper Mr. Barwell exhibited specimens of the ligatures described therein.

Mr. ERICHSEN said Mr. Barwell's case presented many points of importance in surgery and in medicine. It was the first case in which the treatment had been adopted knowingly for aortic aneurism, for in the first case in which the carotid and subclavian were tied an aneurism of the aorta was thought to be innominate, and the ligature was applied under that mistake. But Mr. Barwell's case raised a new principle in the treatment of aneurism, for it was a different thing to tie the carotid and subclavian for innominate than for aortic aneurism. In the former some effect might be produced, but it was difficult to see how, in the latter case (when the whole length of the innominate lies between the seat of ligature and the aorta), the stream in the aorta could be affected. If any effect were at all produced it would be to augment the volume and force of the blood sweeping through the aorta. As to the other operation for aortic aneurism—viz., ligature of the left carotid—there have been cases fairly successful; but he had thought that sometimes the occlusion of the carotid was rather the effect of commencing consolidation of the clot in the aneurism than the cause of this. Further, he urged extreme caution on the part of surgeons in resorting to ligature for aortic aneurism. Cases had failed, and in them disease of the heart or extensive disease of the aorta was present; so that, looking to the extreme difficulty of diagnosis, the fact that by medical treatment life may be prolonged for many years, and the risks entailed by operation, he would hesitate much before assenting to the proposition that ligature of the large vessels at the root of the neck was an advance in the treatment of aortic aneurism.

Dr. GREEN said the diagnosis of aortic aneurism in the case related by Mr.

Barwell was beyond doubt; but he could not pretend to say how far it involved the innominate. The man was treated by rest, restricted diet, and iodide of potassium in large doses; but in spite of all the pressure symptoms increased. These symptoms were chiefly those of pressure on the right bronchus, so that the air entered the right lung very imperfectly. Dr. Green then passed the case over to Mr. Barwell, and he was astonished to see the marked improvement that took place in a few days after the operation—the pain and dyspnoea ceased, and the lung expanded more freely. Still it was probable that the aneurism would again increase. He thought that during the last week or two pulsation had increased.

Mr. HOLMES said that all must concede the difficulties there are in the diagnosis of these cases, and the inadvisability of resorting to such radical measures as ligature of the subclavian and carotid until a fair attempt had been made to treat the case medieally. But there was no doubt that surgical interference had saved patients from apparently imminent death. In the case of the young girl on whom he had operated there was no question as to her desperate condition. She had been treated for a long time medically. It is now four years since the operation, and she is still in moderately good health. Still, he confessed to not being clear as to the precise part of the aorta involved, and did not think Mr. Barwell had clearly shown how the distinction could be made during life between an aneurism springing from the right and one from the left side of the aorta. In the case described the evidence was certainly strong in favour of its springing from the right half of the aorta, whilst the want of any difference between the radial pulses excluded the idea of its being an innominate aneurism. His own rule was to delay operative interference until, by its extension up the neck, the aneurism threatened life by pressure on the air-passages. He still adhered to the opinion, opposed to that of Wardrop, that the effect of tying the third part of the subclavian is to increase the circulation through the first part and to cause the enlargement of the collaterals. He asked what proof Mr. Barwell had in favour of the view that obliteration of the first part of the subclavian followed on ligature of the third part. But he believed that the great benefit results from coagulum extending along the carotid into the sac of the aneurism. Speaking of the new form of ligature, Mr. Holmes hoped that it would be found to answer its purpose, which was the same as that had in view by John Hunter when he tied the femoral artery by flat tapes in order not to divide the coats. In order to be efficient, the ligature should undergo no change for a long time—a year or so. If Mr. Barwell could promise this, then he (Mr. Holmes) for one would never attempt to divide the internal and middle coats of the vessel. It was the insecurity of catgut, its rapid absorption, that made it absolutely necessary to divide the coats in using the ligature. He confessed there was not the slightest evidence in favour of the organization of catgut ligatures. If Mr. Barwell's ligatures would organize, they would be very valuable indeed.

Mr. BARWELL in reply, said that the “new principle” of his operation was really involved in the considerations advanced by Dr. Cockle, in favour of ligature of the left carotid for aortic aneurism. The question was not settled. The cases already on record show that a certain influence for good is produced in the aortic current by deligation of vessels at the root of the neck. Mr. Heath's case, Dr. Holmes's case, and his own former case, where life was prolonged for ten weeks, were instances of this; and although it was true that in Mr. Heath's case the deligation was practised under an error in diagnosis, he (Mr. Barwell) doubted if it would have got well had the left and not the right vessels been tied. Was it possible to distinguish those cases in which deligation should have a curative effect and those in which it should not be curative? And then could we distinguish between those cases in which the right carotid should be tied and those in which the

left? In cases such as the one read that night the position of the aneurism was not doubtful, and by a careful study of previous symptoms, sphygmography, etc., a clear diagnosis may often be carried out. He agreed with Mr. Holmes, that encroachment of the aneurism on the respiratory organs should be taken as an indication for operation. He would not tie rashly nor ineconsiderately, and would, if possible, try to get a clear idea of the position of the aneurism; nor would he operate until medical measures had been exhausted. As to the ligature, he hoped it would prove efficient. As long as it remained around the wound, so as to occlude it until the coagulum had become firmly adherent to the walls of the vessel, it would fully serve its purpose. He differed entirely from Mr. Holmes in his criticism upon the effect produced on the first part of the subclavian by ligature of the third part. In one of his previous cases the subclavian became completely obliterated; whilst in his lectures Mr. Holmes gives eleven cases in which the carotid only was tied and the subclavian left, all of whom died from increase of the aneurism, due as he (Mr. Barwell) believed, to the continued flow of blood through the innominate.

Electrolytic Treatment of Aneurisms of the Aorta.

At the meeting of the Academie de Médecine on January 21, 1879, Dr. BUCQUOY communicated the following interesting observation. The patient was a woman aged 58 years, in whom an aneurism of the ascending aorta had suddenly developed itself. Two years later, pulsations could be detected in the tumour, which bulged out considerably on the right side of the thorax, and spread over the second, third, and fourth intercostals, completely covering the ribs and their cartilage, so that they could no longer be felt. Seeing the eccentric and lateral position of the aneurism, and urged by the impending peril, M. Bucquoy resolved to try Ciniselli's electrolytic treatment for aneurisms. The first sitting took place on the 12th of June, 1878. Dr. Dujardin Beaumetz assisted, and the operation was carried out according to his modified proceeding. Two needles were plunged into the most prominent parts of the tumour to the length of two and a half centimetres, and brought alternately into contact during five minutes, with the positive pole of a Gaiffe's pile, the negative pole of which was applied to the patient's thigh. The current was allowed to pass through her body for about twenty minutes. During the operation she complained of very violent pains, which were followed by an inflammatory tension of the tumour, making the latter very painful to pressure. But at the same time the general and functional troubles were lessened, the dyspnea had decreased, and the patient could sleep. A fortnight later, a second sitting was followed by the same phenomena, but the tumor collapsed markedly. After three more operations it had almost become solid, and the patient was well enough to leave the hospital and return to her work. Two months later, she again presented herself, complaining of a general feeling of lassitude, and of shortness of breath. The aneurismal sac again increased in size, but was not nearly as large as when first seen. Four more sittings were then held, and finally succeeded in reducing the aneurism to its present state. The bag has collapsed, and forms a hard lump, which does not give way under pressure, and is of a fibrous consistency. At the upper end there is a small pointed prominence of the size of a small nut, which pulsates very strongly. The cure is not complete, but there is no doubt as to the possibility of completing it. M. Bucquoy concludes from this and many other cases that electrolytic treatment may prove extremely useful in cases of sacciform aneurisms, adherent to one portion of the coat of the aorta only.—*London Med. Record*, May 15, 1879.

Resection of the Elbow for Ankylosis.

In an able essay in the *Revue Mensuelle de Méd. et de Chir.*, bearing that stamp of sound judgment and wide experience and research which we should expect from this author, M. OLLIER makes several propositions, which put the question of resection of the elbow-joint in a wholly new light, deserving the attention of all surgeons. The entire subject is handled at considerable length, anatomically, clinically, and historically, and with great care, but his practical conclusions may be briefly summarized as follows.

He admits that the grounds upon which we usually resect the elbow-joint for disease are sound, viz., to put an end to long and wasting suppuration, etc. But he goes further, and advocates the operation in all cases where ankylosis is imminent. He enters a protest against the generally received idea "that ankylosis at a right or slightly obtuse angle after grave arthritis of the elbow should be regarded as a fortunate result, which it is proper to respect." This result should, he says, be forestalled, and "whether the arthritis be cured or not, one is justified in resecting with the one aim in view of restoring the movements of the joint if the subject is in a condition as regards age, social position, etc., which render the operation certain in its results and necessary."

But, again, if an existing ankylosis is bilateral, the operation is indisputably called for, no matter at what angle it has taken place; also if unilateral, when the subject is young and likely to be much troubled in his occupation by the loss of motion of the joint.

The author regards himself as justified in these conclusions by a careful study of the results of recorded cases, and by the success of his own operations, which are described in detail in the paper before us. But he guards himself in thus advocating very free operation. He remarks very truly that "before undertaking a resection of the elbow for ankylosis we must examine and know the conditions which experiment has shown to be necessary for the establishment of a new articulation." These he points out in his paper. We have two great dangers to avoid: in young persons a return of the ankylosis, in adults undue mobility of the new joint, calling in each case for an intelligent modification of the operative procedure. He recommends the subperiosteal method, but, if so, a zone of periosteum corresponding to the line of the new joint must be removed, so that there shall be a break in the new bone formed, and ankylosis may thus be prevented. The bones should first be separated with chisel and mallet if ossified too firmly to be broken with the hand. Mere removal of a cuneiform portion of bone at the joint will not answer: a complete resection must be performed. And even so in young subjects it requires the greatest care to prevent ankylosis returning.

Finally, in the subsequent treatment of the case, the surfaces of section must be kept apart to a degree proportionate to the tendency to ankylosis depending on the youth of the subject, etc. Other things being equal, they will be brought nearer together, the farther the individual has passed the period at which osseous development ceases.—*London Med. Record*, March 15, 1879.

Amputation at the Hip-joint; Iliac Arteries Compressed by Lever.

At a recent meeting of the Clinical Society of London (*Lancet*, April 26, 1879) Mr. A. PEARCE GOULD read notes of a case of amputation at the hip-joint, in which the iliac arteries were compressed by Davy's lever. The patient, a man aged twenty-eight, was admitted into Westminster Hospital with advanced disease of the hip. Excision of the head of the femur, which was separated from the neck, was performed, but it became necessary to remove the limb.

Mr. Gould did this by prolonging his excision wound downwards a short distance, and then severing the thigh circularly—an oval amputation in fact. He claimed for this method that it considerably lessened the extent of the cut surface, and the uninjured inner part of the thigh was very useful in supporting the posterior flap, and in aiding the nutrition of the flaps. He recommended it especially in cases of amputation following excision. The iliac vessels were controlled by Davy's lever passed into the rectum. There was no flow of blood during the amputation, only that lying in the severed vessels escaping. At the end of the operation the blood in the tray, mixed with serum and sawdust, measured less than three ounces. In comparing Davy's lever with Pancoast's tourniquet, which is usually employed, Mr. Gould held that it had the following advantages: 1, it disturbed the circulation less; 2, it did not interfere with the respiratory movements, nor was it interfered with by them; 3, its use was not prevented by obesity, rigidity of the abdominal walls, or the existence of abdominal tumours; 4, the pressure required was less; 5, less liability to injury of viscera and peritoneum; 6, greater ease and security in application; 7, greater cheapness and durability; 8, if the lever were not at hand, its place could be more easily supplied. The lever was first suggested and used by Mr. R. Davy, in a young child, in January, 1877; then by Mr. Gould, in December, 1878, and since then by Mr. H. Marsh, Mr. Armstrong, Mr. Davy, and Mr. Cadge, and in every case successfully. Mr. Gould showed some deep sutures which he had employed to maintain the flaps in exact apposition. They were steel pins riveted at one end to a flat oval disk of vulcanite; this pin is passed through the flaps up to the disk, and then a smaller disk of pure black rubber is slipped down over the pin to the other flap; by its elasticity it grips the pin. Three of them were used, and held the flaps so firmly that the patient was able to turn in bed and move his stump without assistance. The patient progressed very favourably for forty hours, but died at the end of sixty-eight hours, and at the autopsy all the veins of the left foot, leg, and thigh were found to be filled with black coagulum, which reached just into the common iliac vein. There was no sign of injury of the rectum, peritoneum, or arteries.

Mr. MACNAMARA said this was the second case in which he had seen Mr. Davy's method employed—the first being an anaemic child in whom amputation was performed for hip disease. No more than an ounce and a half of blood was lost, and the child did well. Still, the method required great care on the part of the assistant; and the length of the lever from the artery rendered the compression somewhat uncertain. It might injure the rectum, especially in a child. For these reasons he had advised Mr. Gould not to use it, but the result falsified his fears. A few days after he asked Mr. Davy to demonstrate the procedure on the dead subject; and, as it happened, it was found that the lever could not be passed into the rectum of that case. So that it was quite possible it might sometimes fail. At any rates, the condition of the bowel should be first ascertained.

Mr. MARSII had lately assisted Mr. Young, of Sevenoaks, in an amputation for hip disease, he (Mr. Marsh) having charge of the compressor. He found no difficulty in introducing the rod nor in compressing the vessel, and during the amputation very little blood was lost. The plan was worthy of a careful trial, for Lister's tourniquet had its defects, especially if the patient be in a low condition. A short time ago he amputated the thigh high up for secondary hemorrhage, and, not daring to put on Lister's tourniquet, the artery had to be compressed digitally. The patient died, losing more blood from the operation than he could afford. The lever may be useful in the treatment of femoral or iliac aneurism.

Mr. FURNEAUX JORDAN had no experience of Mr. Davy's lever, which seemed

to be a useful and simple addition to surgical appliances. He had recently recorded in the *Lancet* a method of amputation at the hip-joint by enucleation of the femur, separating soft parts nearly to the knee-joint, then dividing the thigh at its lower part. In that way a large amount of tissue was preserved, and greater safety insured. Only three days ago he had performed this operation a second time, the case being one of rapidly-spreading gangrene. The case was doing fairly well. He had also heard that at the General Hospital, Nottingham, both Mr. Littlewood and Mr. Baddard had performed the operation, giving a series of four successful cases by this method.

Mr. M. BAKER inquired whether in Mr. Gould's case the thrombosis was due to the compression of the iliac vein by the lever. He had found no difficulty in the use of Lister's tourniquet in a case of amputation at the hip; and in two other cases at the Evelina Hospital, where the operation was performed for hip disease, there was no difficulty in compressing the abdominal aorta. In these cases it would not have been necessary to use Davy's lever. Mr. Jordan's method might be of service with reference to antiseptics, but the time it must take would surely favour the production of shock sooner than by a more rapid method. He had recently heard of a case where an hour and a half was occupied in the operation.

Mr. HEATH had assisted Mr. Swayne, of Devonport, in an amputation of the same kind as that subsequently performed by Mr. Lee. The case was one in which the head of the femur had been previously excised; but such cases belonged to a different category from those where a tumour had to be dealt with; and it was *these* cases which were so fatal. Mr. Jordan's method might be described as an elongation of Mr. Lee's. The difficulty experienced in passing the lever in a subject after death might not obtain in the living body, the condition of the rectum being so different in the two cases.

Mr. HOWSE said that in amputation of the hip the choice lay between digital compression of the iliac artery and its compression by Mr. Davy's method: and he could welcome any device by which the great strain of compressing the artery digitally might be avoided. Mr. Jordan's method, although applicable to cases of amputation after excision, was, as Mr. Heath had said, far less feasible when tumours were concerned than when the head of the femur was *in situ*. In such cases too much time would be required for the operation. Then it was essential to remove all sinus-tissue, which formed so great a factor in the after-history of the patient, for if it were left, lardaceous disease might subsequently develop. In all his cases he had made flaps of skin only.

Mr. F. JORDAN said that in no case had the operation by the method he had described taken more than four or five minutes to accomplish.

Mr. G. BROWN asked what was the cause of the thrombosis. It seemed reasonable to attribute it to the absorption of carbolic acid. If produced by the pressure of the lever, the clotting would have occurred on the opposite side.

Mr. HULKE, in calling on Mr. Gould to reply, said that the discussion had been gratifying. The oval operation was a favourite one of Guthrie's, and he had helped Charles Guthrie to do it in 1849 or 1850, making an external and internal skin flap, and cutting the muscles short. In military surgery this form of stump was very preferable to a heavy flap in cases where the wounded required removal. The disadvantages attributed to Lister's tourniquet had followed its prolonged use, and not when it was applied only for a short time. The lever should not be advocated unfairly.

Mr. GOULD, in reply, said he believed there was a stricture of the rectum in the case which Mr. Macnamara had referred to. The lever had been once used for aneurism, but only for twenty minutes. In his case there was no sign of

injury to the vessels discovered after death. He attributed the thrombosis to carbolic-acid poisoning.

Sutural Junction of a Divided Ulnar Nerve.

At a recent meeting of the Clinical Society of London (*Lancet*, May 24, 1879) Mr. HULKE read the notes of a case of sutural junction of the ulnar nerve fifteen weeks after its complete severance by a roofing-slate; early restoration of function. He said the procedure was a rare one, but where practised had already given most satisfactory results, and held out promise of restoration to many an otherwise crippled limb. This case was interesting from the long interval that elapsed after the injury before the operation was performed, and from the speedy restoration of commencing nerve function, which was only three or four weeks after the operation. The patient, a blacksmith, aged fifty-three, was struck across the inner side and front of elbow by a slate dislodged from a roof. The wound thereby produced healed slowly, and was painful from the first, the pain assuming a neuralgic character. The forearm and arm wasted; the man's health suffered, and he was quite unable to do any work. Fifteen weeks afterwards all parts supplied by the ulnar nerve in the hand were numbed and cold, and the scar in front of the elbow was exquisitely tender. The patient was then chloroformed, and an Esmarch's bandage put on. The ulnar nerve was exposed at the elbow, and found to be completely divided, and the two ends widely separated. The upper end was bulbous, and was dragged out of its course by the cicatrix; the lower end was shrivelled. In both ends were minute particles of slate embedded. Both ends were removed by clean transverse sections, and were then found to be three-quarters of an inch apart. In order to bring them together the upper end was stretched and drawn down, and joined as closely as possible to the lower one by four silk sutures passed through the sheath. Absolute contact was not obtainable. The operation was done, and the wound afterwards dressed antiseptically. The neuralgia ceased at once, and did not recur, and in less than six weeks the patient returned home. Sensation, which had begun to return about a month after the operation, rapidly increased, so that upon leaving the hospital the man went at once to his work.

Mr. MARSH said that two days ago Mr. Savory had operated on a similar case, where the ulnar nerve had been divided at the elbow, almost as in Mr. Hulke's case, but catgut sutures were used, and he did not think the upper end was stretched. Mr. Marsh also referred to Mr. Wheelhouse's case of suture of the sciatic nerve, where function was restored to a completely palsied limb. Such cases showed the great advances of surgery, for he remembered ten years ago, at the Children's Hospital, the case of a child whose lower limb was perfectly paralyzed from a deep wound in the thigh, but where no operation was entertained.

Dr. ALTHAUS observed that the length of time which had elapsed from the date of injury showed what might be done by surgery. Physiological experiments had shown that if two ends of a severed nerve be approximated to within a quarter of an inch there would be perfect reunion; but if a longer interval were left then union only took place by fibrous tissue. In cases of simple division without excision of a part of the nerve union took place in from seven to ten days; if a small part were excised, union was delayed for two, three, or even four weeks. Hitherto a large number of cases of nerve-injury had been looked on as incurable.

Mr. HEATH asked Mr. Hulke whether observations upon the return of sensation were made especially on the ring finger; for it was stated that after division of a nerve there may be a reverse current by means of anastomotic filaments with neighbouring nerves—in this case the median. Some years ago, in laying open some sinuses about the elbow, he divided accidentally the ulnar nerve, but im-

mediately united the ends by a single stitch put through the centre of the nerve. The suture was not seen again, it excited no pain, and the patient recovered power, but not completely. At the time he had dreaded lest the presence of the thread in the nerve might produce tetanus.

Mr. G. BROWN said that Mr. Wheelhouse's case was remarkable because the operation was done so long after the injury—two years he thought—and the separation between the divided ends was two inches. The man entered the Leeds Infirmary with the intention of having the limb amputated, it being a useless encumbrance.

Mr. HULKE said that after operation the two ends were brought as close as they could be together, without being in absolute contact. As to the length of time elapsing between the injury and operation, he believed there were others on record, in addition to Mr. Wheelhouse's, which exceeded this. He had two or three times found nerves repaired after division, *e. g.*, after operating for frontal tie. In one case he twice excised a portion of the frontal branch of the fifth nerve, and on each occasion the pain reappeared after a time. In another case, where he cut out nearly half an inch of nerve, sensitiveness recurred. In reply to Mr. Heath, he said that no observations were especially made to ascertain whether the median nerve had any share in the restoration of sensibility; but before the operation the ulnar side of the ring-finger was absolutely numb, and after the operation it regained its sensibility. At least three-quarters of an inch of nerve was removed. He could say nothing as to the condition of the skin on the fingers, and the man had not been to the hospital since he left it to resume his work.

OPHTHALMOLOGY AND OTOLOGY.

Tobacco Blindness.

The following are the conclusions at which Dr. MARTIN has arrived in his recent thesis for the doctor's degree, regarding disorders of the eyes produced by tobacco. 1. It is easy to distinguish between amblyopia caused by alcoholic poisoning and by abuse of nicotine, as in both cases the affection presents characteristic symptoms. 2. The most important of these symptoms is the condition of the pupil, which is dilated in alcoholic amblyopia and contracted in the other case. In the first case, the affection progresses irregularly and with occasional changes for the better, which are followed by relapses; while, in the second case, its progress is slow but uninterrupted. In the one, both eyes are always affected to the same extent; in the other, they are not both affected, or at least not simultaneously. The patients do not see as well at night as during the daytime, and do not suffer from hallucinations, illusions of sight, or diplopia. In alcoholic amblyopia, on the contrary, the patients cannot bear a strong light, see better during the night, and complain of hallucinations, polyopia, and diplopia. 3. Visual disturbances, when connected with poisoning by tobacco, are manifested under the following forms: *a.* binocular amblyopia; *b.* muscular amblyopia with central scotoma; *c.* amblyopia caused by both tobacco and alcohol.—*British Med. Journal*, May 17, 1879.

Singing in the Ears treated by Nitrite of Amyl.

MICHAEL, who was well acquainted with the sedative influence of nitrite of amył on the sympathetic system, and especially on the vaso-motor nerves, resolved (*Archives Med. Belges*) to try whether it would not prove equally successful in

singing in the ears, and eventually obtained good results in nineteen cases out of twenty-seven.

From two to five drops of nitrite of amyl were inhaled in one dose. The inhalation was continued as long as the following symptoms lasted, viz., a flushed face and injection of the vessels of the eye, and was discontinued the moment the patient began to feel giddy. It was noticed that all the patients who subsequently improved complained that the noise in the ears increased during inhalation, but as soon as the flush began to disappear on the face, the ringing noise decreased, and was less than before the inhalation. In some patients the improvement lasted only one hour, in others for some weeks, but as a rule it lasted from two to ten days. A second inhalation, if not made too soon after the first, had much more marked effects. The author thinks that at least two days must be allowed to elapse between two inhalations; and that the second must not be taken in cases of acute catarrh, or where the singing noise is due to some mechanical cause.—*Lond. Med. Record*, May 15, 1879.

MIDWIFERY AND GYNÆCOLOGY.

The Use of Forceps and its Alternatives in Lingering Labours.

Dr. ROBERT BARNES, in his opening address at the debate on this subject at the Obstetrical Society of London (*Lancet*, May 17, 1879), stated the following proposition as points that chiefly challenge discussion :—

1. In lingering labour, when the head is in the pelvic cavity, the forceps is better than its alternatives.

2. In lingering labour, when the head is engaged in the pelvic brim, and when it is known that the pelvis is well formed, the forceps is better than its alternatives.

3. In lingering labour, when the head is resting on the pelvic brim, the liquor amnii discharged, and it is known, either by exploring with the hand or by other means, that there is no disproportion, or only a slight degree of disproportion, even although the cervix uteri is not fully dilated, the forceps will generally be better than its alternatives.

4. In proportion as the head is arrested high in the pelvis, in the brim, or above the brim, the necessity, the utility, and safety of the forceps become less frequent.

5. As a corollary from the preceding proposition, increasing caution in determining on the use of the forceps, and greater skill in carrying out the operation, are called for.

In most things there is a middle way. “*Ni jamais, ni toujours,*” is a proverb full of wisdom. I cannot better illustrate the wisdom of deducing the greatest good from over-caution on the one hand and from too bold enterprise on the other, than by citing the precept and practice of Boër. This famous surgeon, having witnessed in Paris the extreme activity of French midwifery, and in London the too procrastinating practice of England, recognized the middle course as the best, constructed his forceps of medium length, saying, “Everything is not to be taken away from Nature, neither is everything to be left to her.”

Puerperal Fever treated by Benzoate of Soda.

As this is the first case where benzoate of soda has been given in puerperal fever, the following observations by Dr. PETERSON, published in the *Centbl. für d. Med. Wiss.*, March 8, 1879, will not be found void of interest:—

The patient, a primipara, aged 25, had puerperal fever twelve days after delivery. There was considerable parametritis of the right portion and the fundus of the uterus, the parts were tender to pressure, and the abdomen much distended by gases. The patient had diarrhoea, the pulse was from 140 to 150, and the temperature 40° . After 15 grammes of salicylate of soda had been administered, the temperature sank to 38.8° , but the patient was in an alarming state of prostration; the dyspnœa and flatulence had increased. Wine and strong beer were repeatedly given in large doses, the pulse rose, and a half per cent. solution of quinine administered every two hours, together with 7.5 grammes of salicylate of soda, as the patient complained of singing in the ears. However, as her state did not improve, and the collapse again became threatening, the author resolved to try a solution of benzoate of soda, 10 grammes to 200 grammes of water. The patient rapidly improved, the temperature sank, she slept well, and soon recovered.—*London Med. Record*, May 15, 1879.

A Giant Birth—One Child weighing twenty-three and three-quarter pounds.

Dr. A. P. BEACH, of Seville, Ohio, reports (*Med. Record*, March 22, 1879) the ease of a child weighing, at birth, $23\frac{3}{4}$ pounds, which is said to be the largest weight at birth on record. The parents, Captain and Mrs. Bates, are well known to the public, and have been exhibited as giants in the principal towns of this country and Europe. They are respectively, 7 feet 7 inches and 7 feet 9 inches in height. Mrs. Bates had dropsy of the amnion coexistent with general dropsy, from which she suffered during the last months of pregnancy. The water amounted to not less than six gallons. The infant, after considerable difficulty, was safely delivered, and measured 30 inches in height; 24 inches around the breast; 27 inches at the breach; head, 19 inches; and feet, $5\frac{1}{2}$ inches in length. The secundines weighed 10 pounds. The mother was considerably exhausted by the labour, but made a good recovery.

Special Malady of the Osseous System developed during Intra-uterine Life, and which is generally described under the name "Rickets."

The main points of M. DEPAUL's paper (*Révue des Sciences Méd.*, January, 1879) are as follow: 1. The alterations which the bony skeleton can undergo during intra-uterine life have very different origins. 2. Those which are generally described as congenital rickets do not seem to have the same origin as those which characterize rickets developed after birth. 3. The form and direction of the curvatures, the internal structure of the bones, etc., unite in establishing a well-marked line of demarcation. 4. While in the malady developed during foetal life everything is explained by the absence or the irregularity of the deposit of calcareous matter, in true rickets the morbid state attacks bones already formed to a great extent, deranges the regular progress of their development, and submits them to a softening process, which may be deemed the chief cause of the subsequent deformities. 5. Moral emotions on the part of the mother and imagination have no direct influence on these faults of formation of which we are treating. 6. Nor can we assign them to lesions of the nervous centres, and to the muscular retractions which could result therefrom; although a large number of bony deformities seem certainly to have some such origin. 7. The health of

the mother has nothing to do with the development of these symptoms; in no case has there been established the existence of syphilis, rickets, or scrofula. 8. It should be remarked that, in many cases, this malady was manifested in *twin pregnancies*, and this peculiarity has, probably, something to do with its causation. 9. The facts which have been given as examples of congenital fracture have been wrongly interpreted. These are but a variety of one and the same lesion, viz., the absence complete, but limited in extent, of the deposit of the calcareous matter; which, on the other hand, can take place in excess at certain points, and from those enlargements which have wrongly been given as a proof of a process of consolidation. 10. These alterations of the skeleton are far more frequent than is generally believed. 11. Their gravity consists, not only in the changes brought about in the conformation of the limbs, but also in their hindering, by deforming the chest, the mechanism of respiration, and in depriving the brain of sufficient protection against external lesions.—*London Med. Record*, April 15, 1879.

The Diagnostic Puncture of Abdominal Cysts with Serous Contents of Low Density.

Prof. SPIEGELBERG makes an interesting contribution on this subject to the *Archiv für Gynäkologie* (vol. xiv. s. 175), in which he argues that not only in the case of cysts of the broad ligaments, but even in ovarian cysts, the existence of a fluid of low density and serous nature may be taken as evidence that the cyst wall has ceased to grow actively, and is being merely distended by gradual accumulation of its contents. In such cases, he holds that operation should not be performed, as it is more than likely that after puncture the cyst wall will atrophy, and the ovarian disease disappear.—*Edinburgh Med. Journal*, June, 1879.

Double Oophorectomy.

Dr. ALEXANDER R. SIMPSON reports (*British Med. Journal*, May 24, 1879) a case of double oophorectomy in which this operation was successfully performed on a woman aged 36, who had suffered from severe dysmenorrhœa during the whole of her menstrual life. He opened the abdomen through the linea alba, and ligatured the pedicle with carbolized silk. Antiseptic precautions were used. The patient made a good recovery, and was greatly benefited, although some irregular menstruation still occurred.

MEDICAL JURISPRUDENCE AND TOXICOLOGY.

Sulphate of Soda as an Antidote against Poisoning with Carbolic Acid.

Dr. SONNEBERG has made the important discovery (*Med. Chir. Centr. Bl.*. March 21, 1879) that in cases of poisoning with carbolic acid, repeated dressings with a five per cent. solution of sulphate of soda are a very efficient antidote. The urine is at first of a dark green colour, with a slight brown tinge, but soon assumes a normal colour, when the dressings with carbolic acid may be resumed without danger.—*Lond. Med. Record*, May 15, 1879.

OBITUARY NOTICE.

"A life well spent, whose early care it was
His riper years should not upbraid his green ;
By unperceived degrees he wears away :
Yet, like the sun, seems larger at his setting."

BLAIR.

SINCE the last number of this Journal was issued, the Senior Editor, who for upwards of half a century was so intimately associated with its best interests, and who during all that long period occupied so conspicuous a place in the professional eye, has passed away, beloved and respected by all who knew him, and venerated by thousands who never saw him, or pressed the hand of the man who had conferred upon them such inestimable benefits. DR. ISAAC HAYS died at his residence, in Philadelphia, on the 12th of April, 1879, aged 83 years. For some time prior to this event, it was apparent that, with the advance of age, his strength was gradually giving way, but it was not until about the middle of last February that any serious inroads were made upon his health, owing to an attack of influenza, which was then epidemic in this city, and which, in his case, as, indeed, in many others, finally terminated in bronchitis. He outlived the attack, but never rallied from its effects, or regained his strength, and died gradually exhausted from the failure of his vital powers. It is gratifying to know that his mental faculties were undimmed by age, and perfect to the last.

Dr. Hays was born in Philadelphia, July 5, 1796, and was the eldest son of Samuel and Richea Gratz Hays. He received his early scholastic training in the then well-known Academy under the charge of the Rev. Samuel B. Wylie, an eminent divine and classical scholar, and entered the University of Pennsylvania in 1812, taking his degree in the department of arts four years afterwards. At the earnest solicitation of his father, who was a merchant largely engaged in the East India trade, he now reluctantly entered upon mercantile life, but finding this to be une congenial to his tastes, he soon abandoned it, and in 1817 commenced the study of medicine as an office pupil of Dr. Nathaniel Chapman, one of the great medical luminaries of his day. He graduated at the University of Pennsylvania in 1820, the subject of his thesis being "Sympathy." The faculty of this institution consisted at that time of Physick, Wistar, James, Dorsey, Coxe, Chapman, Hare, and Gibson, names famous in American medical history.

The early professional life of Dr. Hays was passed in his native city, in

active study, and in arduous preparation for the great battle of life, those struggles for favour and reputation which few men can so well appreciate as the young physician, especially one beginning his career in a large city, unheralded, and unaided by friends or the patronage of the great and influential. That the young aspirant for position and fame had his share in the world's struggles may well be imagined, but how well he overcame them his whole life abundantly attests. It is only the laggard that falls by the wayside. A youth who is true to himself knows no such word as failure. It may be assumed that Dr. Hays was not indifferent to general practice, but from the beginning of his professional career he devoted much of his leisure to the study of the diseases of the eye, in which, as life advanced, he acquired an extensive reputation as one of the most successful practitioners on this side of the Atlantic. Indeed, he may justly be regarded as one of the pioneers in ophthalmic surgery and medicine in the United States. One of his earliest literary contributions was a long and exhaustive article in the thirteenth volume of the *Philadelphia Journal of the Medical and Physical Sciences* for 1827 on purulent ophthalmia; followed, soon after, by another, still more elaborate, on inflammation of the scleroticæ. In 1822, he was appointed one of the Surgeons to the Pennsylvania Infirmary for Diseases of the Eye and Ear; and a similar distinction was conferred upon him on the organization of Wills Hospital, an ophthalmic infirmary, founded in 1834 by Mr. James Wills, a prominent merchant of this city. This position he retained until 1854, when the pressure of increasing demands upon his time compelled him to retire. When Professor Dewees published his work on the *Practice of Medicine* in 1833, Dr. Hays supplied the chapter on diseases of the eye. In 1843, he edited, with numerous additions, and sixty-seven illustrations, Mr., afterwards Sir William, Lawrence's celebrated *Treatise on the Diseases of the Eye*, a work which, under his supervision, passed through three editions, and enjoyed a most extensive circulation in this country. With this edition Mr. Lawrence was so much pleased that he wrote a warm letter of thanks to Dr. Hays. "I feel," he says, "that I could not have received a higher compliment, and I shall always hold the circumstance in grateful remembrance." Dr. Hays devised an instrument, combining the advantages both of a knife and a needle, for the division of hard cataracts, which, although now obsolete, was at one time much employed by American oculists; and he was also the author of a new operation for the cure of strabismus. He was one of the earliest observers to detect astigmatism, and to investigate the subject of colour blindness, which is now attracting so much attention in connection with railway operatives. On the organization, in 1870, of the Ophthalmological Society of Philadelphia, Dr. Hays was elected its first president.

In 1834, Dr. Hays projected the *American Cyclopædia of Practical Medicine and Surgery*, intended as a digest of medical literature. Of this work, which was published by the old firm of Carey, Lea, & Blanchard,

and which was designed to reflect the then existing state of the art and science of medicine in all their diversified branches and ramifications, only two volumes were issued. The contributors to the work were Franklin Bache, Nathaniel Chapman, Reynell Coates, D. Francis Condie, William P. Dewees, Robley Dunglison, Gouverneur Emerson, Eli Geddings, R. E. Griffith, Thomas Harris, Isaac Hays, Hugh L. Hodge, William E. Horner, Samuel Jackson, John K. Mitchell, Robert M. Patterson, John C. Warren, and George B. Wood; all men of more or less professional renown in their day and generation. With such aid and co-operation, it might reasonably have been anticipated that the Cyclopædia would be a success, but such was not to be the case. The real trouble was, not any want of ability on the part of the editor or of his collaborators, but inadequate support. The country was not ripe for a publication projected upon so extended a scale, and involving so much time, labour, and expense. The second volume, issued three years after the first, closed with "axilla." Proceeding at this slow pace, at least fifteen or twenty more closely printed volumes would have been required to complete the work. The learned editor executed his part of the contract with his accustomed zeal and ability. His office mainly consisted in correcting the press, in furnishing bibliographical references, and in writing innumerable articles to fill up the gaps among the more elaborate ones; of which, however, he himself supplied two of the most important and exhaustive for the first volume. Many of the papers of the collaborators constitute elaborate monographs on the subjects of which they respectively treat, and it is safe to affirm that they will forever remain as among the most valuable contributions to the medical literature of the nineteenth century. Among the more able and erudite of these contributions, those of the late Professor Eli Geddings, of Charleston, South Carolina, deserve especial commendation as finished, scholarly, and learned essays. The articles furnished by Drs. Reynell Coates, Hugh L. Hodge, R. E. Griffith, and Robley Dunglison are also worthy of particular encomium. Had the work been completed, it would have formed a lasting monument alike creditable to its original projector and to his learned associates. How such an enterprise would be received at the present day, when the number of medical men is at least four times as great as it was when Dr. Hays assumed the editorship of the American Cyclopædia, and when there is so much more talent among scientific contributors, is a question which can only be determined by a similar effort, which, it may safely be predicted, must ere long be made as one of the prominent necessities of the age. There is sufficient talent, genius, and scholarship among American physicians to accomplish any enterprise to which they may direct their attention.

Dr. Hays never published any original work, but he was the editor of a number of foreign productions, to all of which he made valuable additions. Mention has already been made of his edition of Lawrence's *Treatise on*

the Eye. His additions to this work, many of which were the deductions from his own ample experience, were numerous and valuable, and indeed, to use Sir William Lawrence's own words, "might well have constituted a separate publication." In 1829 he brought out an American edition of Arnott's *Elements of Physics*, which went through several editions, and in 1846 one of Hoblyn's *Dictionary of Medical Terms*, works which rendered good service in their day. In 1831 he published jointly with his friend, the late Dr. Robert Eglesfeld Griffith, afterwards Professor of Medicine in the University of Virginia, a translation of Broussais's celebrated treatise on the *Chronic Phlegmasiæ*, in two volumes octavo, and in 1832 his *Principles of Physiological Medicine*. In 1833 he edited the *Cholera Gazette*, a paper designed to communicate useful intelligence respecting the clinical history and treatment of cholera, which had caused such sad havoc during the preceding year in Canada and in our eastern cities. He also contributed, at various times, articles to the pages of the *American Journal of the Medical Sciences*, chief among which are those on the eye, already referred to, on ununited fractures, dislocations of the humerus, and fractures of the ankle-joint. Considering the nature of these topics, one is inevitably led to the conclusion that Dr. Hays's early proclivities were of a decidedly surgical character.

Dr. Hays never occupied any chair in a medical school, but at an early period of his professional life he associated himself with Drs. John D. Godman, R. E. Griffith, and W. H. Keating, as a lecturer on Practical Medicine and Diseases of the Eye and Ear. How long this arrangement continued is not now known. The probability, however, is that it did not last long, as Dr. Godman, the projector of the enterprise, settled in New York, in 1827, as Professor of Anatomy in what was then known as Rutgers Medical College.

The attention of Dr. Hays was not confined exclusively to the study and practice of his profession, or to the onerous duties of a public journalist. The cultivation of natural history had irresistible charms for a mind so æsthetic and so diversified in its tastes and requirements. Many of his earlier leisure hours were spent in pursuits of this kind; and it is a singular fact that he became a member of the Academy of Natural Sciences of Philadelphia two years before he took his medical degree. Throughout his long life he retained his interest in, and affection for, this fascinating study. He was the author of several valuable contributions to palaeontology. In 1865 the Academy honoured him with its Presidency, an office which he occupied until December, 1869, when advancing years compelled him to decline a re-election. In 1828 Dr. Hays edited an edition, in three quarto volumes, of Alexander Wilson's *American Ornithology*, that great and wonderful work of the Paisley weaver, peddler, schoolmaster, poet, and naturalist, who, in 1794, emigrated to this country, and who, on his deathbed, expressed a desire, soon fully

carried out, to be buried in the Old Swedes' Church-yard, in Philadelphia,—in a spot where, as he said, “the birds might sing over his grave.” We can well imagine that such a task as this, in the younger and more enthusiastic days of Dr. Hays, must have been essentially a labour of love. The great ornithologist died in 1813, and it is, therefore, not improbable that he and his future editor were personally acquainted with each other. Nay, indeed, it is not at all unlikely that the young student imbibed his first love of natural history from this great and wonderful man, the subject of such a curiously checkered and eventful life.

Although Dr. Hays accomplished a great deal of work in various directions, work always well and conscientiously performed, and evinced a remarkable diversity of talent and learning, his claims to posthumous fame will chiefly rest upon his labours and long career as a public journalist. At the time of his demise he was the oldest editor in the United States, if not in the world. Until last summer this honour, as it may be justly regarded, was enjoyed by the veteran editor of the *New York Evening Post*, Mr. William Cullen Bryant, but at his death it fell to the lot of Dr. Hays. A service, steady and persistent, of any kind of fifty-two years, is no ordinary occurrence; and when it is devoted to constant and assiduous labour in the diffusion of knowledge of the highest interest to mankind, it especially deserves more than passing mention.

The career of Dr. Hays as a medical editor commenced in 1827, in connection with the *Philadelphia Journal of the Medical and Physical Sciences*, founded in 1820 by Dr. Nathaniel Chapman, Professor of Medicine in the University of Pennsylvania; and it is a notable fact, often referred to even at the present day, that this celebrated man chose for the motto of the work the famous paragraph published only a short time previously by Sydney Smith in the sixty-fifth number of the *Edinburgh Review*: “In the four quarters of the globe, who reads an American book? or goes to an American play? or looks at an American picture or statue? What does the world yet owe to American physicians or surgeons?” The editorship of the *Journal* remained exclusively in the hands of its originator until the close of the ninth volume, in 1824, when, in consequence of increasing labours and other engagements, Drs. William P. Dewees and John D. Godman were added to the editorial staff, followed, in February, 1827, by Dr. Isaac Hays—the first step in a career which was destined to last for upwards of half a century. Owing to Dr. Godman’s removal to New York in this year, and to the constant demands of an onerous practice upon the time of Dr. Dewees, the editorial labour now devolved upon Dr. Hays. With a view to making the *Journal* more broadly representative and national in character, the co-operation of the leading medical minds in all parts of the country was now secured, and in November, 1827, the title of the journal was changed to the *American Journal of the Medical Sciences*, and, although it was continued until 1841 without any

names upon the title-page save those of the publishers, Dr. Hays had the sole management of the work until 1869, when, in consequence of advancing age he availed himself of the valuable aid of his son, Dr. I. Minis Hays, upon whose shoulders now gracefully rests the mantle so long and so worthily worn by his distinguished father.

Of Dr. Chapman, the founder of the *Philadelphia Journal of the Medical and Physical Sciences*, and, indirectly, of the *American Journal of the Medical Sciences*, and of his two associates upon the editorial staff, Dewees and Godman, this is neither the time nor the place to speak. It is sufficient to state that these are names that are indelibly engraved upon the history of American medical literature. The learned and facetious Chapman, a native of the "Old Dominion," as Virginia was so long called, acquired a world-wide reputation as an able and facile writer, a great wit, and an eloquent, accomplished, and popular teacher in the chair of medicine in the University of Pennsylvania, which he adorned for upwards of a quarter of a century; Dewees, as is well known, became the American autocrat in midwifery; and Godman, more celebrated as an anatomist and naturalist than as a physician, will ever be remembered as a child of genius, born to misfortune, to hard struggles, and to an early grave.

When Dr. Hays assumed the charge of the *American Journal of the Medical Sciences*, he took care to collect around him a group of collaborators representing many of the best and most prominent men in various sections of the country, distinguished for their ability as writers, their learning, and their scientific attainments. The original roll comprised thirty-nine names, to which, on the appearance of the fourth volume, in 1829, four more were added. Of these collaborators—among which are conspicuous the names of Physick, Chapman, Bigelow, Warren, Dudley, Francis, Godman, Hosack, and Dewees—twenty-six occupied chairs in different medical schools, the remainder being prominent medical practitioners. All these men have passed away, the last to do so being the venerable Professor Jacob Bigelow, of Boston, who died only last January at the ripe age of ninety-three years. In the selection of this long list, care was taken to embrace in it all the branches of medicine then taught in our schools, while others were chosen with special reference to their fitness for the important office of reviewers. It will thus be seen that the editorial change in the Journal was inaugurated under the most favourable auspices, the young editor throwing all his energies into the service; while the names of the publishers—Carey, Lea, & Carey—were a sufficient guarantee of the success of the commercial portion of the undertaking. The object of the Journal, as stated in the fourth volume, was to establish a national work, designed to advance the interests of medical science, to foster and develop native talent, to disseminate useful medical knowledge, to elevate the character and dignity of the profession, and to supply a want deeply felt by the American practitioner. Up to that time no American periodical on

so extended a scale, or combining so many important elements, had yet appeared on this continent. Anonymous communications, as well as all personalities, were scrupulously excluded; and another important feature was that the Journal should never condescend to notice any attacks that might be made upon its editors or contributors by disappointed outsiders, smarting under the lash of just criticism or merited rebuke. Each number of the Journal was then, as it is now, issued under three distinct heads—a department for original communications, a review and bibliographical department, and a periscopic department—the latter being devoted to a condensed account of the recent progress of medical science, as taught and practised in different portions of the civilized globe. Sailing under such colours, with the aid of such canvas, the Journal at once inspired public confidence and became an assured success. While other medical quarterlies, both at home and abroad, have succumbed under the pressure of circumstances, brought about by a change in professional sentiment or pecuniary embarrassments, the *American Journal of the Medical Sciences* is proudly holding its own, enshrined in the confidence and affection of the American physician, and supported by a corps of collaborators rich in knowledge and ability, and ambitious of sustaining its best interests as a great national exponent of the medical sciences and of medical literature. When I look at the one hundred and three stately volumes of this Journal, as they stand upon my library shelves, issued under the supervision of one man, I am ready to exclaim, "*Si monumentum requiris, circumspice.*" Such a work is an immense library in itself, and when we reflect that it embodies the results of the practice, observation, and experience of many of the best minds of this and of other countries during a period of upwards of half a century, it is impossible to place too high an estimate upon it. What other journal, American or foreign, can boast of having furnished its readers during the same period upwards of 50,000 octavo pages of closely printed matter, of which at least three-fourths are original? Many of the original articles will be ranked in all time to come as among the most valuable contributions to our medical literature, while not a few of its reviews will be regarded as models of English composition, equal to any that have ever appeared in the United States or Great Britain.

Large as the Journal was, it was found, in the increasing progress of medical art and science, to be insufficient to embrace a satisfactory abstract of the labours of American and European physicians and surgeons; and hence, as early as 1843, the publishers of the Journal, at the instance of the editor, commenced to issue in monthly numbers what is known as the *Medical News*, as a part of that periodical. To meet a still further demand, another journal was issued in 1874, under the same editorial supervision, entitled the *Monthly Abstract of Medical Science*. Both these works have done good service, and have no doubt greatly contributed to the maintenance of the popularity of the parent Journal.

It is a remarkable fact, one, indeed, hardly appreciated even in medical circles of Philadelphia, that at the time Dr. Hays entered upon the active duties of life there was a galaxy of young men in his native city who, born about the same period—that is, either near the close of the last century, or very near the opening of the present—ran together a race of fame and fortune, pitted, as it were, one against another. However this may have been, they all became eminently distinguished either as teachers, authors, or practitioners, or, indeed, in all these relations. These men, mentioned in the order of their seniority, were Samuel Jackson, Franklin Bache, Charles D. Meigs, René La Roche, George McClellan, Hugh L. Hodge, John K. Mitchell, D. Francis Condie, and George B. Wood. To this list may be added the names of John Bell and Reynell Coates. All these were, like Dr. Hays, graduates of the University of Pennsylvania, with a good general education, and several of the most prominent were born in the same year.

The early professional life of Jackson was spent in the apothecary business, and it was not until near middle age that he entered upon the brilliant career which made his name so famous as a teacher and a physician. Connected for a time with what was long known as the Philadelphia Medical Institute, founded by Dr. Chapman, he was for twenty-eight years Professor of the Institutes of Medicine in the University of Pennsylvania, the idol of his classes, and one of the most popular men of his day in and out of the profession. His work, entitled the *Principles of Medicine*, published in 1832, was, scientifically considered, a failure, although it was well received by the profession. Who will ever forget Jackson's handsome, manly face, his melodious voice, his fine conversational powers, or his elegant manners? Franklin Bache will long be remembered as an excellent chemist, and as an acceptable and instructive teacher. As one of the authors of the *United States Dispensatory*, a work which has passed through numerous editions, he rendered most important services to his profession and to his country. What can one say of Charles D. Meigs that has not already been said a thousand times, the popular, beloved, kind-hearted, benevolent, and facetious man, scholar, and professor? Was a teacher ever more worshipped by his pupils? As a writer on obstetrics and gynaecology who does not know Meigs? His treatise on "*Woman and her Diseases*" abounds in delightful reading, but, like all similar productions, is not by any means free from error. René La Roche immortalized himself by his learned and exhaustive treatise on "*Yellow Fever*," a work of gigantic labour, combining the elegance of the accomplished scholar with the patience and the research of the German philosopher. George McClellan, a native of Connecticut, a man of "restless activity and sleepless vigilance," settled in Philadelphia in 1817, where he founded the Jefferson Medical College, and acquired a world-wide reputation as a brilliant and successful surgeon. Hugh L. Hodge, who

died only a few years ago, has, like his illustrious *confrère*, Meigs, left immortal works on midwifery and gynæcology. For many years he adorned the chair of midwifery in the University of Pennsylvania, for which he and Meigs were at one time rival candidates. Of John K. Mitchell's early professional life much was spent in chemical and philosophical pursuits, which very justly soon brought him prominently before the public. When, in 1841, the chair of medicine became vacant in the Jefferson Medical College, he was unanimously elected to fill it, and remained in its occupancy until the time of his death, in 1858. He wrote besides many scientific and medical essays, a volume of poems and a treatise on the cryptogamous origin of malarious and epidemic fevers. Condie was the author of an excellent and popular work on the Diseases of Children, and a most active and useful collaborator of the *American Journal of the Medical Sciences*. He was a rapid writer, and yet his chirography was strikingly beautiful, being a neat round hand as easy to read as print. Of George B. Wood, who died on the 30th of March last, less than a fortnight before Dr. Hays, it is only necessary, in this connection, to observe that he was the worthy peer of this remarkable group of men. Learned, refined, and highly cultured, he was a successful and popular teacher, first of chemistry, then of *materia medica*, and, lastly, of the principles and practice of medicine, and a copious author, whose works enjoyed a wide circulation at home, passing through numerous editions, while one of them, the *Treatise on Medicine*, was extensively employed for several years as a text-book in the schools of Great Britain. The name of John Bell, who died in 1872, will be long remembered in connection with medical journalism, reprints of foreign works, and an excellent treatise on baths. As a lecturer he failed, and his style as a writer was unfortunately too diffuse. Nevertheless, John Bell performed much useful labour. Of Reynell Coates, a man of brilliant talents and an erratic genius, mention has already been made in connection with Dr. Hays's *Cyclopædia of Practical Medicine and Surgery* to which he was one of the most erudite and elaborate contributors. He had talents of a high order, and had he been spared to his profession he might have earned immortal renown.

Most of the men whose career has been thus briefly sketched died at an advanced age, the life of several of them extending into the eighties. Only three of them died before they reached their seventieth year. All had their early struggles, and several left the world as poor as when they entered it. All were hard-working, ambitious men, with few exceptions devoted students, good writers, and excellent teachers, with scholarly tastes, refined manners, and cultivated intellects. Well may the question be asked, What would Philadelphia have done without them? Who for a third of a century would have supplied their places as journalists, authors, teachers, and practitioners, men who shed so much lustre upon her name and fame? Who could doubt that these men, constantly acting and reacting upon one

another, stimulated each other's ambition, and thus paved the path to glory and to usefulness?

The permanent prosperity of any great and commanding journal, whether medical or literary, must of necessity be materially influenced by the character and stability of its publishers, whatever may be the talent, industry, or genius of its editor. In this particular, Dr. Hays had every reason to congratulate himself; for during his protracted connection with the *American Journal of the Medical Sciences*, and the various changes which the original publishing firm experienced, not a word of misunderstanding ever arose between the existing parties to mar the success of the enterprise, or to disturb their friendly relations. The founder of the house which was destined to attain a world-wide reputation, especially for the part which it has played for upwards of half a century in supplying the country with standard medical works, was Mathew Carey, an eminent philanthropist, whose voluminous writings on the political and social sciences exercised no little influence in their day, and whose *History of the Yellow Fever of 1793* is still referred to by medical writers. In 1783, his political writings having rendered him obnoxious to the British Government, he was obliged to emigrate from Ireland and take refuge in this country, and soon after entered upon the book trade in this city. It was under his auspices that Dr. Chapman brought out the first four volumes of the *Philadelphia Journal of the Medical and Physical Sciences*. In 1822, Mr. Carey retired from the firm, and was succeeded by his son, Mr. Henry C. Carey, and his son-in-law, Mr. Isaac Lea, who have since become so distinguished in the literary and scientific world, the one as a great writer on political economy, and the other as the author of numerous contributions to natural history, evincing great research and rare talent. It is gratifying to know that these two gentlemen are still among us in the enjoyment of excellent health and unimpaired mental vigour. In 1833, the late Mr. William A. Blanchard, a man of remarkable executive ability, was added to the firm, which then became known as Carey, Lea, & Blanchard. In 1839, Mr. Carey retired, followed, in 1851, by Mr. Lea, who was succeeded by his son, Mr. Henry C. Lea, the firm being now Blanchard & Lea. In 1865, Mr. William A. Blanchard retired and his son, Mr. Henry Blanchard, entered, and the firm again took the name of Lea & Blanchard, but only for a few months, Mr. Blanchard being obliged to retire on account of ill health, thus leaving the field solely to Mr. Lea, a gentleman widely known on both sides of the Atlantic, not only as a great publisher, but as an accomplished scholar and vigorous writer.

Dr. Hays took an active interest in everything that related to his profession and to the prosperity of his native city. He was one of the founders of the Franklin Institute, and from 1828 to 1840 acted as its corresponding secretary, an office in which he was succeeded by the late Alexander Dallas Bache, the eminent scientist. He was chairman of the building committee

of the College of Physicians of Philadelphia, and an active member of the American Philosophical Society, of which in early life he was elected a member. He took a prominent part in the organization of the American Medical Association, of which he was the first treasurer and chairman of the committee which framed the admirable Code of Ethics by which the Association, as well as every other medical society in America, has ever since been governed. If this code is not faultless, it is safe to assert that it is as free from errors as it is, perhaps, possible for any code of morals to be. The highest praise has been awarded to it not only in Great Britain but also on the continent of Europe. Dr. Hays was a member of numerous societies—medical, literary, and scientific, both domestic and foreign—and his labours as a public journalist devolved upon him an enormous correspondence with distinguished men on both sides of the Atlantic.

In 1834, Dr. Hays was married to Sarah, daughter of Isaac Minis, Esq., of Savannah, Georgia, who, with four children, survives him. It will not be invading the sanctity of private life to add that he was a most affectionate and devoted husband, and a loving and watchful father. In stature he was about five feet ten inches, well proportioned, with blue eyes, a well-formed head, finely chiselled profile, and a countenance beaming with benevolence. In his manners he was emphatically a gentleman of the old school, bland, gentle, and dignified, with a sweet and subdued voice, and a warm, sympathizing heart. His habits were those of the diligent student. Punctuality was one of his cardinal virtues. He had a daily task before him, and therefore never postponed until to-morrow what he knew was necessary to be done to-day. He was an early riser, and seldom required more than five or six hours of sleep to refresh his mental and physical faculties. His journalistic work was usually done in the early morning, or in the evening, thus leaving him the remainder of the day for his professional, literary, and public duties. As a writer, his style was free, simple, and scholarly, without any effort at ornament or display. Although in early life he was fond of society, yet, as he advanced in years, and his professional labours increased, he was gradually obliged to withdraw himself from the public, and to spend most of his leisure, especially at night, in his library and in the domestic circle, or among a few intimate friends. His last appearance, if my memory serves me, was at a large social gathering at the commencement of the late war, at one of the last meetings of our Wistar Party Club, of which he was an old member. The portrait which accompanies this number is from a daguerreotype taken in 1852.

Dr. Hays had a large and well-selected library, rich in works of the fathers of the profession and in periodical literature, much, if not most, of the latter being sent to him in exchange for the *American Journal of the Medical Sciences*. The exchange list, as it is called, has for many years past been immense, and forms a striking proof of the esteem in which the

editor and his Journal were regarded by the profession in all parts of the civilized world.

If, as Bacon has declared, every man is a debtor to his profession, then I am sure this obligation was never more thoroughly, more conscientiously, or more honestly discharged than in the present instance. No man ever had a more just or a more exalted conception of the functions of a public journalist, of the sanctity of the press, or of the moral duties of an editor, than Dr. Isaac Hays. If he had not possessed all the great qualities of a public editor—brains, great intelligence, judgment, method, patience, boundless industry, and a full appreciation of the wants of his readers—he could not possibly have sustained himself for fifty-two years at the head of such an enterprise. During that long period how many journalists in this and other countries have broken down and brought financial ruin upon themselves and their publishers? Dr. Hays not only possessed the requisite qualifications for carrying on successfully such a work, but he threw his whole soul into the enterprise, and never for a moment lost sight of his great and responsible duties. No man, who has not himself been an editor, can form any adequate idea of the drudgery, toil, and anxiety incident to such a life. The correction of the press is of itself no ordinary task, but when, as in the case of the *American Journal of the Medical Sciences*, such a publication extends its arms into the most remote parts of the civilized world, it is easy to conceive that the man who occupies the editorial tripod must be a person of vast industry, of a clear head, of a far-seeing eye, and of immense executive ability. When the history of American medical literature shall be written, an important place will be assigned to this, the greatest and most gifted medical journalist of the nineteenth century; while the present generation will hold in grateful remembrance the inestimable benefits which he conferred upon his profession and his country.

S. D. GROSS.

BOYLSTON MEDICAL PRIZE QUESTIONS.

The Boylston Medical Committee, appointed by the President and Fellows of Harvard University, consists of the following Physicians:—

D. H. STORER, M.D.,
MORRILL WYMAN, M.D.,
HENRY J. BIGELOW, M.D.,

RICHARD M. HODGES, M.D.,
CALVIN ELLIS, M.D.,
SAMUEL CABOT, M.D.

At the annual meeting, held June 9, 1879, it was voted that no dissertation worthy of a prize had been offered on either of the subjects proposed for 1879.

The following are the questions proposed for 1880:—

1. Antiseptic Treatment. What are its Essential Details? How are they best carried out in Practical Form?

2. Diphtheria. Its Causes, Diagnosis, and Treatment.

The author of a dissertation considered worthy of a prize, on either of the subjects proposed for 1880, will be entitled to a premium of One Hundred and Fifty Dollars.

Dissertations on the above subjects must be transmitted, post-paid, to D. H. Storer, M.D., 182 Boylston St., Boston, *on or before the first Wednesday in April, 1880.*

The following are the questions proposed for 1881:—

1. The Effects of Drugs, during Lactation, on either nurse or nursing.

2. Injuries to the Back, without apparent mechanical lesion in their surgical and medico-legal aspects.

The author of a dissertation considered worthy of a prize, on either of the subjects proposed for 1881, will be entitled to a premium of Three Hundred Dollars.

Dissertations on these subjects must be transmitted as above, on or before the first Wednesday in April, 1881.

Each dissertation must be accompanied by a sealed packet on which shall be written some device or sentence, and within which shall be inclosed the author's name and residence. The same device or sentence is to be written on the dissertation to which the packet is attached.

The writer of each dissertation is expected to transmit his communication to the President of the Committee, D. H. Storer, M.D., in a distinct and plain handwriting, and with the pages bound in book form within the time specified.

Any clew by which the authorship of a dissertation is made known to the Committee will debar such dissertation from competition.

Preference will be given to dissertations which exhibit original work.

All unsuccessful dissertations are deposited with the Secretary, from whom they may be obtained, with the sealed packet unopened, if called for within one year after they have been received.

By an order adopted in 1826, the Secretary was directed to publish annually the following votes:—

1st. That the Board do not consider themselves as approving the doctrines contained in any of the dissertations to which premiums may be adjudged.

2d. That in case of publication of a successful dissertation, the author be considered as bound to print the above vote in connection therewith.

RICHARD M. HODGES, M.D., Sec'y, Boston, Mass.

Publishers of Newspapers and Medical Journals throughout the country are respectfully requested to notice the above.

**JEFFERSON MEDICAL COLLEGE,
PHILADELPHIA.**

The Fifty-fifth Session of the Jefferson Medical College will begin on Wednesday, October 1st, 1879, and will continue until the 1st of March, 1880. Preliminary Lectures will be held from Monday, 8th of September.

PROFESSORS.

<p>JOSEPH PANCOAST, M.D., General, Descriptive, and Surgical Anatomy, (Emeritus).</p> <p>S. D. GROSS, M.D., LL.D., D.C.L. Oxon., Institutes and Practice of Surgery.</p> <p>ELLERSLIE WALLACE, M.D., Obstetrics and Diseases of Women and Children.</p> <p>J. M. DA COSTA, M.D., Practice of Medicine.</p>	<p>J. AITKIN MEIGS, M.D., Institutes of Medicine and Medical Jurisprudence.</p> <p>WM. H. PANCOAST, M.D., General, Descriptive, and Surgical Anatomy.</p> <p>ROBERT E. ROGERS, M.D., Medical Chemistry and Toxicology.</p> <p>ROBERTS BARTHOLOW, M.D., Materia Medica and General Therapeutics.</p>
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CLINICAL INSTRUCTION is given daily at the HOSPITAL OF THE JEFFERSON MEDICAL COLLEGE throughout the year by Members of the Faculty, and by the Hospital Staff, which is constituted as follows:

Surgeons.

JOHN H. BRINTON, M.D.,
S. W. GROSS, M.D.,
R. J. LEVIS, M.D.

Ophthalmic Surgeon.

WILLIAM THOMPSON, M.D.

Aural Surgeon.

L. TURNBULL, M.D.

Physicians.

J. SOLIS-COHEN, M.D.,
JAMES C. WILSON, M.D.,
OLIVER P. REX, M.D.,
W. W. VANVALZAH, M.D.

Gynæcologists.

F. H. GETCHELL, M.D.,
J. EWING MEARS, M.D.

Pathologist.

MORRIS LONGSTRETH, M.D.

A SUMMER COURSE of Lectures is given, beginning in the third week in March, 1880, and extending through the months of April, May, and to the middle of June. There is no additional charge for this Course to matriculates of the College, except a registration fee of five dollars; non-matriculates pay thirty five dollars, which is, however, credited on the amount of fees paid for the ensuing Winter Course.

FEES.

Matriculation Fee (paid once)	\$ 5 00
Ticket of each Professor (7) \$20	140 00
Practical Anatomy	10 00
Graduation Fee	30 00

The Annual Announcement, giving full particulars, will be sent on application to

ELLERSLIE WALLACE, Dean.

**PRIZE OF THE ALUMNI ASSOCIATION OF THE COLLEGE
OF PHYSICIANS AND SURGEONS, NEW YORK.**

THIS prize of \$500, for an original essay on some subject connected with medicine or surgery, is open only to the competition of the Alumni of the College of Physicians and Surgeons.

The conditions upon which the prize will be awarded are as follows:—

1. The subject is left to the option of the competitor.
2. The essay must present sufficient original experimental or clinical observation to make it a useful contribution to medical knowledge.
3. The essay, designated by a motto, must be sent to a member of the Committee on Prize Essays, accompanied by a sealed envelope, inscribed with the motto, and containing the name and address of the author, on or before February 1, 1880.

DR. A. BRAYTON BALL, 38 West 36th St.,

DR. T. A. McBRIDE, 12 East 28th St.,

DR. ROBERT F. WEIR, 37 West 33d St.

Committee.

UNIVERSITY OF PENNSYLVANIA.
MEDICAL DEPARTMENT.

Thirty-Sixth Street and Woodland Avenue (Darby Road), Philadelphia.

One Hundred and Fourteenth Annual Session, 1879-80.

PROFESSORS.

CHARLES J. STILLÉ, LL.D., Provost.
GEORGE B. WOOD, M.D., LL.D., Emeritus Professor of Theory and Practice of Medicine.
HENRY H. SMITH, M.D., Emeritus Professor of Surgery.
JOHN NEILL, M.D., Emeritus Professor of Clinical Surgery.

JOSEPH LEIDY, M.D., LL.D., Professor of Anatomy.
RICHARD A. F. PENROSE, M.D., LL.D., Professor of Obstetrics and Diseases of Women and Children.
ALFRED STILLÉ, M.D., LL.D., Professor of Theory and Practice of Medicine, and Clinical Medicine.
D. HAYES AGNEW, M.D., LL.D., John Rhea Barton Professor of Surgery and Clinical Surgery.

HORATIO C. WOOD, M.D., Professor of Materia Medica, General Therapeutics, and Pharmacy, and Clinical Professor of Nervous Diseases.
WILLIAM PEPPER, M.D., Professor of Clinical Medicine.
WILLIAM GOODELL, M.D., Professor of Clinical Gynaecology.
JAMES TYSON, M.D., Professor of General Pathology and Morbid Anatomy.
THEODORE G. WORMLEY, M.D., LL.D., Professor of Chemistry.
JOHN ASHURST, JR., M.D., Professor of Clinical Surgery.
HARRISON ALLEN, M.D., Professor of Physiology.
WILLIAM F. NORRIS, M.D., Clinical Professor of Diseases of the Eye.
GEORGE STRAWBRIDGE, M.D., Clinical Professor of Diseases of the Ear.
LOUIS A. DUHRING, M.D., Clinical Professor of Diseases of the Skin.

Matriculates are required to attend three winter courses of instruction of five months each, consisting of graded didactic lectures, clinical lectures, and practical work in laboratories and hospitals.

In the graded curriculum adopted, the elementary branches are taught in the *first* course, and students are finally examined at its conclusion upon General Chemistry, Materia Medica and Pharmacy. In the *second* term, while a sufficient repetition of unfinished branches is secured, certain more practical ones are added, and the examinations on Anatomy, Physiology, and Medical Chemistry, at the end of the term are final. In the *third* course is added practical bedside instruction in Medicine, Surgery, and Gynaecology, with clinical facilities in the specialties; and, at its end, students are examined on General Pathology and Morbid Anatomy, Therapeutics, Theory and Practice of Medicine, Surgery, and Obstetrics.

Students who have attended one course in a regular* medical school will be admitted as students of the second course in the University, after having satisfactorily passed an examination in General Chemistry and Materia Medica and Pharmacy. Students who have attended two courses in a regular medical school will be admitted as students of the third course after examination in General and Medical Chemistry, Materia Medica and Pharmacy, Anatomy, and Physiology.

Graduates of other regular medical schools in good standing will be admitted as students of the third course in this institution without any examination.

Graduates of Colleges of Pharmacy and Dental Colleges in good standing are admitted to the second course in the University without an examination.

In the Spring session, beginning the first Monday in April, a valuable course on practical and scientific subjects by a large corps of professors and lecturers is given; and the laboratories of Chemistry, Pharmacy, Histology, Physiology, and Pathology are open, affording a valuable post-graduate course.

The Lectures of the Winter Session of 1879-80 will begin on Wednesday the first day of October, and end on the last day of February.

The Preliminary Course will begin on Monday, Sept 8th.

FEES, IN ADVANCE.—1st course of lectures, including matriculation and dissection, \$155. 2d course \$150, including dissection 3d course \$110, including operating and bandaging. Graduation fee \$30.

For Announcement giving full particulars address

**JAMES TYSON, M.D., SECRETARY,
P. O. Box 2838, Philadelphia.**

DENTAL DEPARTMENT.

The Trustees have established a Dental Department, which it is designed to make the most complete school of Dentistry in the world. The professors include those of Anatomy, Physiology, Chemistry, and Materia Medica, in the Medical Department, with CHAS. J. ESSIG, M.D., D.D.S., Prof. of Mechanical Dentistry and Metallurgy, and EDWIN T. DARBY, M.D., D.D.S., Prof. of Operative Dentistry. Two years' study, two courses of lectures, and examination at the end of the first and second courses, are the requirements for graduation. Graduates of the Dental Department of the University may become candidates for the degree of Doctor of Medicine after attending one additional course of lectures; but students in Dentistry who desire to take the Medical Degree also, must notify the Secretary of the Department of Medicine of such intention before the beginning of the second course of lectures, and add to the studies of the Dental Department those of the Medical.

FEES.—Matriculation \$5. For one course of lectures \$100. Dissecting fee \$10. Graduation fee \$30. Sessions commence as those of the Medical Department. For Announcement address CHAS. J. ESSIG, M.D., D.D.S., Secretary, Dental Department, University of Pennsylvania.

* Homœopathic and Eclectic schools are not recognized as being in this category.

BELLEVUE HOSPITAL MEDICAL COLLEGE, CITY OF NEW YORK.

**MEMBER OF THE AMERICAN MEDICAL COLLEGE ASSOCIATION.
SESSIONS OF 1879-'80.**

THE COLLEGiate YEAR in this Institution embraces a preliminary Autumnal Term, the Regular Winter Session, and a Spring Session.

THE PRELIMINARY AUTUMNAL TERM for 1879-'80 will begin on Wednesday, September 17th, 1879, and continue until the opening of the Regular Session. During this term, instruction, consisting of didactic lectures upon special subjects and daily clinical lectures, will be given, as heretofore, by the entire Faculty, in the same number and order as during the Regular Session. Students expecting to attend the Regular Session are recommended to attend the Preliminary Term, but such attendance is not required.

THE REGULAR SESSION will begin on Wednesday, October 1, 1879, and end about the 1st of March, 1880. During this Session, in addition to four didactic lectures on every weekday except Saturday, two or three hours are daily allotted to clinical instruction.

THE SPRING SESSION consists chiefly of recitations from Text-Books. This Session begins on the 1st of March and continues until the 1st of June. During this Session, daily recitations in all the departments are held by a corps of examiners appointed by the Faculty. Short courses of lectures are given on special subjects, and regular clinics are held in the Hospital and in the College building.

FACULTY.

ISAAC E. TAYLOR, M.D.,

Emeritus Professor of Obstetrics and Diseases of Women, and President of the Faculty.

JAMES R. WOOD, M.D., LL.D.,

Emeritus Professor of Surgery.

FORDYCE BARKER, M.D., LL.D.,

Professor of Clinical Midwifery and Diseases of Women.

AUSTIN FLINT, M.D.,

Professor of the Principles and Practice of Medicine and Clinical Medicine.

W. H. VAN BUREN, M.D.,

Prof. of Principles and Practice of Surgery, Diseases of Genito-Urinary System, and Clinical Surgery.

LEWIS A. SAYRE, M.D.,

Professor of Orthopedic Surgery and Clinical Surgery.

A. A. SMITH, M.D.,

Lecturer on Materia Medica and Therapeutics, and Clinical Medicine.

AUSTIN FLINT, JR., M.D.,

Professor of Physiology and Physiological Anatomy, and Secretary of the Faculty.

JOSEPH D. BRYANT, M.D.,

Prof. of General, Descriptive, and Surgical Anatomy.

R. OGDEN DOREMUS, M.D., LL.D.,

Professor of Chemistry and Toxicology.

EDWARD G. JANEWAY, M.D.,

Professor of Pathological Anatomy and Histology, Diseases of the Nervous System, and Clinical Medicine.

PROFESSORS OF SPECIAL DEPARTMENTS, ETC.

HENRY D. NOYES, M.D.,

Professor of Ophthalmology and Otology.

J. LEWIS SMITH, M.D.,

Clinical Professor of Diseases of Children.

EDWARD L. KEYES, M.D.,

Professor of Dermatology, and Adjunct to the Chair of Principles of Surgery.

JOHN P. GRAY, M.D., LL.D.,

Professor of Psychological Medicine and Medical Jurisprudence.

ERSKINE MASON, M.D.,

Clinical Professor of Surgery.

LEROY MILTON YALE, M.D.,

Lecturer Adjunct upon Orthopedic Surgery.

JOSEPH W. HOWE, M.D.,

Clinical Professor of Surgery.

BEVERLY ROBINSON, M.D.,

Lecturer upon Clinical Medicine.

FRANK H. BOSWORTH, M.D.,

Lecturer upon Diseases of the Throat.

CHARLES A. DOREMUS, M.D., PH.D.,

Lecturer upon Practical Chemistry and Toxicology.

FREDERICK S. DENNIS, M.D., M.R.C.S.,

WILLIAM H. WELCH, M.D.,

Demonstrators of Anatomy.

FEES FOR THE REGULAR SESSION:

Fees for Tickets to all the Lectures during the Preliminary and Regular Term, including Clinical Lectures,	{	\$140 00
Matrikelation Fee		5 00
Dissection Fee (including material for dissection)		10 00
Graduation Fee		30 00

FEES FOR THE SPRING SESSION:

Matrikelation (Ticket valid for the following Winter)	\$5 00
Recitations, Clinics, and Lectures	35 00
Dissection (Ticket valid for the following Winter)	10 00

For the Annual Circular and Catalogue, giving regulations for graduation and other information, address Prof. AUSTIN FLINT, Jr., Secretary, Bellevue Hospital Medical College.

HARVARD UNIVERSITY.

MEDICAL DEPARTMENT—BOSTON, MASS.

NINETY-SIXTH ANNUAL ANNOUNCEMENT. (1879-80.)

FACULTY OF MEDICINE.

CHARLES W. ELIOT, LL.D., President.	CHARLES B. PORTER, M.D., Demonstrator of Anatomy, and Instructor in Surgery.
CALVIN ELLIS, M.D., Prof. of Clinical Medicine, Dean.	FREDERICK I. KNIGHT, M.D., Instructor in Percussion, Auscultation, and Laryngoscopy.
OLIVER W. HOLMES, M.D., Prof. of Anatomy.	J. COLLINS WARREN, M.D., Instructor in Surgery.
HENRY J. BIGELOW, M.D., Professor of Surgery.	REGINALD H. FITZ, M.D., Professor of Pathological Anatomy.
FRANCIS MINOT, M.D., Hersey Professor of the Theory and Practice of Medicine.	W.M. L. RICHARDSON, M.D., Instructor in Obstetrics.
JOHN P. REYNOLDS, M.D., Prof. of Obstetrics.	THOMAS DWIGHT, M.D., Instructor in Histology.
HENRY W. WILLIAMS, M.D., Professor of Ophthalmology.	EDWARD S. WOOD, M.D., Prof. of Chemistry.
DAVID W. CHEREVER, M.D., Professor of Clinical Surgery.	HENRY H. A. BEACH, M.D., Assistant Demonstrator of Anatomy.
JAMES C. WHITE, M.D., Prof. of Dermatology.	WILLIAM H. BAKER, M.D., Instructor in Gynaecology.
ROBERT T. EDES, M.D., Professor of Materia Medica.	WILLIAM B. HILLS, M.D., Instructor in Chemistry.
HENRY P. BOWDITCH, M.D., Prof. of Physiology.	

OTHER INSTRUCTORS.

GEORGE H. F. MARKOE, Instructor in Materia Medica.	EDWARD N. WHITTIER, M.D., Assistant in Clinical Medicine.
FRANK W. DRAPER, M.D., Lecturer on Forensic Medicine.	GEORGE M. GARLAND, M.D., Assistant in Physiology.
CHARLES F. FOLSOM, M.D., Lecturer on Hygiene and Mental Diseases.	ELBRIDGE G. COTTER, M.D., Assistant in Pathological Anatomy.
HENRY P. QUINCY, M.D., Assistant in Histology.	

THE FOLLOWING GENTLEMEN WILL GIVE SPECIAL CLINICAL INSTRUCTION:

FRANCIS B. GREENOUGH, M.D., and EDWARD WIGGLESWORTH, M.D., in Syphilis.

JOHN O. GREEN, M.D., and CLARENCE J. BLAKE, M.D., in Otology.

CHARLES P. PUTNAM, M.D., and JOSEPH P. OLIVER, M.D., in Diseases of Children.

SAMUEL G. WEBBER, M.D., and JAMES J. PUTNAM, M.D., in Diseases of the Nervous System.

Persons who hold no degree in arts or science must pass an *examination for admission* to this School, in Latin, in the elements of Physics, and in English. French or German will be accepted instead of Latin. The admission examination will be held June 23, both at Boston and at Cincinnati; on September 22, at Boston only.

Instruction is given by lectures, recitations, clinical teaching, and practical exercises, distributed throughout the academic year. The year begins September 25, 1879, and ends on the last Wednesday in June, 1880. It is divided into two equal terms, either of which is more than equivalent to the former "Winter Session," as regards the amount and character of the instruction. The course of instruction has been greatly enlarged, so as to extend over three years, and has been so arranged as to carry the student progressively and systematically from one subject to another in a just and natural order. In the subjects of anatomy, histology, chemistry, and pathological anatomy, laboratory work is largely substituted for, or added to, the usual methods of instruction.

Instead of the customary oral examination for the degree of Doctor of Medicine, at the end of the three years' period of study, a series of written examinations on all the main subjects of medical instruction is held at the end of each year; and every candidate for the degree must pass a satisfactory examination in every one of the principal departments of medical instruction during his period of study.

DIVISION OF STUDIES.

For the First Year—Anatomy, Physiology, and General Chemistry.*For the Second Year*—Medical Chemistry, Materia Medica, Pathological Anatomy, Clinical Medicine, Surgery, and Clinical Surgery.*For the Third Year*—Therapeutics, Obstetrics, Theory and Practice of Medicine, Clinical Medicine, Surgery, and Clinical Surgery.

Students are divided into three classes, according to their time of study and proficiency. Students who began their professional studies elsewhere may be admitted to advanced standing; but all persons who apply for admission to the second or third year's class must pass an examination in the branches already pursued by the class to which they seek admission. The examinations are held in the following order:—

At the end of the first year—Anatomy, Physiology, and General Chemistry.

End of second year—Medical Chemistry, Materia Medica, and Pathological Anatomy.

End of third year—Therapeutics, Obstetrics, Theory and Practice of Medicine, Clinical Medicine, Surgery, and Clinical Surgery.

Examinations are also held before the opening of the School, beginning September 22d.

REQUIREMENTS FOR A DEGREE.—Every candidate must be twenty-one years of age; must have studied medicine three full years, have spent at least one continuous year at this school, have passed the required examinations, and have presented a thesis.

COURSE FOR GRADUATES.—For the purpose of affording to those already Graduates of Medicine additional facilities for pursuing clinical, laboratory, and other studies, in such subjects as may specially interest them, the Faculty has established a course which comprises the following branches: Histology; Physiology; Medical Chemistry; Pathological Anatomy; Surgery; Auscultation, Percussion, and Laryngoscopy; Ophthalmology; Dermatology; Syphilis; Otology; Electro-therapeutics; Gynaecology; and Obstetrics. On payment of the full fee the privilege of attending any of the other exercises of the Medical School, the use of the laboratories and library, and all other rights accorded by the University will be granted. Single branches may also be pursued. Graduates of other Medical Schools who may desire to obtain the degree of M.D. at this University, will be admitted to examination for this degree after a year's study in the Graduates' Course. Examination on entrance not required.

FEES.—For Matriculation, \$5; for the Year, \$200; for one Term alone, \$120; for Graduation \$30. For Graduates' Course, the fee for one year is \$200; for one Term, \$120; and for single courses such fees as are specified in the Catalogue. Payment in advance.

Members of any one department of Harvard University have a right to attend lectures and recitations in any other department without paying additional fees.

For further information, or Catalogue, address

DR. R. H. FITZ, Sec'y, 108 Boylston St., Boston, Mass.

CHICAGO MEDICAL COLLEGE.

MEDICAL DEPARTMENT OF THE NORTHWESTERN UNIVERSITY.

SESSION OF 1879-80.

FACULTY.

N. S. DAVIS, M.D., LL.D., Dean,	{ Professors of Principles and Practice of Medicine and of Clinical Medicine.	J. H. HOLLISTER, M.D., Cor. Secretary and Registrar, Professor of General Pathology and Pathological Anatomy.
H. A. JOHNSON, A.M., M.D.,		H. P. MERRIMAN, A.M., M.D., Professor of Medical Jurisprudence and Hygiene
EDMUND ANDREWS, A.M., M.D.,	{ Professors of Principles and Practice of Surgery, and of Clinical Surgery.	WM. E. QUINE, M.D., Professor of Materia Medica and General Therapeutics.
RALPH N. ISHAM, M.D.,		MARCUS P. HATFIELD, A.M., M.D., Professor of Chemistry and Toxicology.
EDWARD W. JENKS, A.M., M.D., Professor of Medical and Surgical Diseases of Women, and of Clinical Gynecology.	{ Professors of Obstetrics and Diseases of Children.	LESTER CURTIS, A.M., M.D., Professor of Histology.
E. O. F. ROLER, A.M., M.D., Professor of Obstetrics and Diseases of Children.		R. L. REA, M.D., Professor of Anatomy.
SAMUEL J. JONES, A.M., M.D., Professor of Oph- thalmology and Otology.	{ Professors of Nervous and Mental Diseases.	HENRY GRADLE, M.D., Lecturer upon Physiology.
J. S. JEWELL, A.M., M.D., Professor of Nervous and Mental Diseases.		ROSWELL PARK, A.M., M.D., Demonstrator of Anatomy and Assistant to the Chair of Anatomy.

GRADED COURSE OF INSTRUCTION.

A graded system of medical instruction was adopted at the organization of this College twenty years ago, and for twelve years it was the only representative of a classified course in this country. The recommendation of this method of teaching by two Medical College Conventions, by the American Medical Association, and by various State Medical Societies; and its more recent adoption by a number of other colleges, including some of the most prominent ones in the land, and its very general approval by the profession at large, afford gratifying evidence that this new departure was a movement in the right direction.

REQUIREMENTS FOR ADMISSION.

All applicants for admission are required to present evidence of graduation in some literary college, or certificates of attendance upon some scientific school or academy. If the applicant have neither diploma nor certificate, he must sustain a satisfactory examination as to his literary qualifications.

ADVANCED STANDING.

Students who have read medicine for one full year, may enter upon the *Middle Course*, by sustaining satisfactory examinations upon the studies embraced in the *Junior Course*.

Students who have read medicine for two years, including attendance upon one full course of lectures in some recognized medical college, may enter the *Senior Course*, by sustaining examinations upon the subjects embraced in the *Junior and Middle Courses*.

THE COLLEGE TERM.

A preliminary course of Didactic and Clinical instruction, introductory to the general course, commences September 1st, and continues till the commencement of the regular Session.

The REGULAR COURSE of lectures commences Tuesday, September 30th, and will continue until March 30th, at which time the usual Commencement exercises will be held.

THE PRACTITIONER'S COURSE.

Designed for practitioners, will commence March 31st, 1880 following the commencement, and will continue till April 25th. This special course is arranged to meet a very general want, and will afford special advantages for a rapid, yet thorough, practical review of the most important subjects in medicine and surgery.

CLINICAL ADVANTAGES.

Mercy Hospital, with its very perfect appointments; the Dispensary and the College clinics offer an abundance of clinical material in every department of Medical and Surgical teaching. Over fourteen thousand patients were treated here during the last year.

In the Hospital every Senior student serves as dresser for an allotted term in the surgical wards, and receives a certificate to that effect.

Every Senior student has personal charge of one or more cases of obstetrics, under the immediate supervision of the Professor of Obstetrics.

In the Gynecological Department, where large numbers of females apply for local treatment, each Senior student is trained by the Professor in the minute details of examination and treatment of the medical and surgical diseases of women.

PHYSIOLOGICAL LABORATORY.

Aided by the generous contributions of its alumni, this College is developing a PHYSIOLOGICAL LABORATORY, which will be opened for instruction during the present year.

PRIZES.

Will be given by the Dean, for the best Thesis; by the Professor of Anatomy, a First Prize to the best Anatomist—open to all classes; Second Prize to the best Anatomist in the Junior Class; the Sun Prize, for the best Anatomical Preparation; and the Earl Prize, for the best Essay on Diseases of Children.

FEES.

Lecture Fees for the College Year, \$75.00. Practitioners' Course, \$30.00. Graduation Fee, \$30.00. Registration Fee, \$5.00. Demonstrators' Ticket, \$5.00. Laboratory Ticket, \$5.00. Hospital Ticket, \$6.00.

For information concerning Text Books, Board, Seats in the College, requirements for Graduations, etc., consult the Annual Announcement, or address

PROF. J. H. HOLLISTER, M.D.,

Secretary and Registrar.

MEDICAL DEPARTMENT OF THE UNIVERSITY OF LOUISIANA—NEW ORLEANS.

FACULTY.

T. G. RICHARDSON, M.D., Professor of General and Clinical Surgery.

SAMUEL M. BEMISS, M.D., Professor of the Theory and Practice of Medicine and Clinical Medicine.

STANFORD E. CHAILLÉ, M.D., Professor of Physiology and Pathological Anatomy.

JOSEPH JONES, M.D., Professor of Chemistry and Clinical Medicine.

SAMUEL LOGAN, M.D., Professor of Anatomy and Clinical Surgery.

ERNEST S. LEWIS, M.D., Professor of General and Clinical Obstetrics and Diseases of Women and Children.

JOHN B. ELLIOTT, M.D., Professor of Materia Medica and Therapeutics and Clinical Medicine.

ALBERT B. MILES, Demonstrator of Anatomy.

The next annual course of instruction in this Department (now in the forty-sixth year of its existence) will commence on Monday, the 20th day of October, 1879, and terminate on Saturday, the 14th day of March, 1880. The first three weeks of the term will be devoted exclusively to Clinical Medicine and Surgery at the Charity Hospital; Practical Chemistry in the Laboratory; and dissections in the spacious and airy Anatomical Rooms of the University.

The means of teaching now at the command of the Faculty are unsurpassed in the United States. Special attention is called to the opportunities presented for

CLINICAL INSTRUCTION.

The Act establishing the University of Louisiana gives the Professors of the Medical Department the use of the great Charity Hospital as a school of practical instruction.

The Charity Hospital contains nearly 700 beds, and received, during the last year, more than six thousand patients. Its advantages for professional study are unsurpassed by any similar institution in this country. The Medical, Surgical, and Obstetrical Wards are visited by the respective professors in charge daily, from eight to ten o'clock A. M., at which time all the students are expected to attend and familiarize themselves, *at the bedside of the patients*, with the diagnosis and treatment of all forms of injury and disease.

The regular lectures at the hospital, on Clinical Medicine by Professors Bemiss, Elliott, and Joseph Jones, Surgery by Professors Richardson and Logan, Diseases of Women and Children by Professor Lewis, and Special Pathological Anatomy by Professor Chaillé, will be delivered in the amphitheatre on Monday, Wednesday, Thursday, and Saturday, from 10 to 12 o'clock A. M.

The administrators of the hospital elect annually, by competitive examinations, twelve resident students, who are maintained by the institution.

TERMS.

For the Tickets of all the Professors	\$140 00
For the Ticket of Practical Anatomy	10 00
Matriculation Fee	5 00
Graduation Fee	30 00

Candidates for graduation are required to be twenty-one years of age; to have studied three years; to have attended two courses of lectures, and to pass a satisfactory examination.

Graduates of other respectable schools are admitted upon payment of the Matriculation and half lecture fees. They cannot, however, obtain the Diploma of the University without passing the regular examinations and paying the usual Graduation Fee.

As the practical advantages here afforded for a thorough acquaintance with all the branches of medicine and surgery are *quite equal* to those possessed by the schools of New York and Philadelphia, the same fees are charged.

For further information, address

T. G. RICHARDSON, M.D., *Dean.*

**UNIVERSITY OF THE CITY OF NEW YORK.
MEDICAL DEPARTMENT.**

410 East Twenty-Sixth St., opposite Bellerue Hospital, New York.

THIRTY-NINTH SESSION—1879-80.

FACULTY OF MEDICINE.

- REV. HOWARD CROSBY, M.D., LL.D., Chancellor of the University.**
ALFRED C. POST, M.D., LL.D., Emeritus Professor of Clinical Surgery; President of the Faculty.
CHARLES INSLEE PARDEE, M.D., Professor of Diseases of the Ear; Dean of the Faculty.
JOHN T. DARBY, M.D., Emeritus Professor of Surgery.
JOHN C. DRAPER, M.D., LL.D., Professor of Chemistry.
ALFRED L. LOOMIS, M.D., Professor of Pathology and Practice of Medicine.
WILLIAM DARLING, A.M., M.D., F.R.C.S., Professor of Anatomy.
WILLIAM H. THOMSON, M.D., Professor of Materia Medica and Therapeutics.
J. W. S. ARNOLD, M.D., Professor of Physiology and Histology.
J. WILLISTON WRIGHT, M.D., Professor of Surgery.
WM. M. POLK, M.D., Professor of Obstetrics and Diseases of Women and Children.
FANEUIL D. WEISSE, M.D., Professor of Practical and Surgical Anatomy.
LEWIS A. STIMSON, M.D., Professor of Pathological Anatomy.
A. L. RANNEY, M.D., Adjunct Professor of Anatomy.
JOSEPH E. WINTERS, M.D., Demonstrator of Anatomy.

POST-GRADUATE FACULTY.

- D. B. ST. JOHN ROOSA, M.D., Professor of Ophthalmology.**
WM. A. HAMMOND, M.D., Professor of Diseases of the Mind and Nervous System.
STEPHEN SMITH, M.D., Professor of Orthopedic Surgery.
J. W. S. GOULEY, M.D., Professor of Diseases of the Genito-Urinary System.
MONTROSE A. PALLETT, M.D., Professor of Gynaecology.
HENRY G. PIFFARD, M.D., Professor of Dermatology.
A. E. MACDONALD, M.D., Professor of Medical Jurisprudence.

THE COLLEGiate YEAR is divided into three Sessions: a Preliminary Session, a Regular Winter Session, and a Spring Session.

THE PRELIMINARY SESSION will commence September 17, 1879, and will continue until the opening of the Regular Winter Session. It will be conducted on the plan of that Session.

THE REGULAR WINTER SESSION will commence on the 1st of October, 1879, and end about the 1st of March, 1880.

The location of the new College edifice being immediately opposite the gate of Bellevue Hospital, and a few steps from the ferry to Charity Hospital, Blackwell's Island, the Students of the University Medical College are enabled to enjoy the advantages afforded by these Hospitals, with the least possible loss of time. The Professors of the practical Chairs are connected with the Hospitals, and the University Students are admitted to *all the Clinics* given therein *free of charge*.

In addition to the daily Hospital Clinics, there are eight Clinics each week in the College Building. Five Didactic Lectures will be given daily in the College building, and Evening Recitations will be conducted by the Professors of Chemistry, Practice, Anatomy, Materia Medica, etc., Physiology, Surgery, and Obstetrics, upon the subjects of their Lectures.

THE SPRING SESSION embraces a period of twelve weeks, beginning in the first week of March and ending the last week of May. The daily Clinics, Recitations, and Special Practical Courses will be the same as in the Winter Session, and there will be Lectures on Special Subjects by the Members of the Post-Graduate Faculty.

THE DISSECTING ROOM is open throughout the entire Collegiate year; material is abundant, and it is furnished free of charge.

STUDENTS WHO HAVE STUDIED TWO YEARS, and who have attended two full courses of lectures, may be admitted to examination in Chemistry, Anatomy, and Physiology, and, if successful, will be examined at the expiration of their full course of study on Practice, Materia Medica and Therapeutics, Surgery, and Obstetrics; but those who prefer it may have all their examinations at the close of their full term.

FEES.

For Course of Lectures	\$140 00
Matriculation	5 00
Demonstrator's fee, including material for dissection	10 00
Graduation fee	30 00
Post-Graduate certificate	30 00

For further particulars and circulars address the Dean,

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THE
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OF THE MEDICAL SCIENCES
FOR OCTOBER 1879.

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TO READERS AND CORRESPONDENTS.

ALL communications intended for insertion in the Original Department of this Journal are only received for consideration with the distinct understanding that they are sent for publication to this Journal alone, and that abstracts of them shall only appear elsewhere subsequently, and with due credit. Gentlemen favouring us with their communications are considered to be bound in honour to a strict observance of this understanding.

Contributors who wish their articles to appear in the next number are requested to forward them before the 1st of November.

Compensation is allowed for original articles and reviews, except when illustrations or extra copies are desired. A *limited* number of extra copies (not exceeding fifty) will be furnished to authors, *provided the request for them be made at the time the communication is sent* to the Editor.

The following works have been received:—

Étude Historique et Clinique sur la Trépanation du Crâne la Trépanation guidée par les Localisations Cérébrales. Par le Dr. JUST LUCAS-CHAMPIONNIÈRE. Paris : V. A. Delahaye et Cie, 1878.

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Paresis of the Sympathetic Centres. By CHARLES T. REBER, M.D. St. Louis : Geo. O. Rumbold & Co., 1879.

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- Protrusion of the Stump of the Pedicle through the Cicatrix more than three years after Ovariotomy. By HENRY P. WENZEL, M.D. Lomira, Wis.
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- How shall the Degree of Doctor of Medicine be Conferred? By E. FLETCHER INGALS, M.D. Chicago, 1879.
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 Report of the City Hospital of Boston, 1879.
 Report of the State Lunatic Asylum, Utica, N. Y., 1878.
 Report of the New York Society for the Relief of the Ruptured and Crippled, 1879.

The usual foreign and American exchanges have been received; their separate acknowledgment is omitted for want of space.

Communications intended for publication, and books for review, should be sent *free of expense*, directed to I. MINIS HAYS, M.D., Editor of the American Journal of the Medical Sciences, care of Mr. Henry C. Lea, Philadelphia. Parcels directed as above, and (carriage paid) under cover, to Mr. Charles J. Skeet, Bookseller, No. 10 King William Street, Charing Cross, London, will reach us safely and without delay.

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CONTENTS
OF
THE AMERICAN JOURNAL
OF
THE MEDICAL SCIENCES.
NO. CLVI. NEW SERIES.

OCTOBER, 1879.

ORIGINAL COMMUNICATIONS.

MEMOIRS AND CASES.

ART.	PAGE
I. On Phantom Stricture and other Obscure Forms of Rectal Disease. By W. H. Van Buren, M.D., Professor of Surgery in Bellevue Hospital Medical College, New York.	317
II. Sarcoma of the Long Bones: Based upon a Study of One Hundred and Sixty-five Cases. By Samuel W. Gross, A.M., M.D., Mütter Lecturer on Surgical Pathology in the College of Physicians of Philadelphia, and Surgeon to the Jefferson Medical College Hospital, and to the Philadelphia Hospital.	338
III. Four Cases of Ovarian Tumour and one of Fibro-cystic Tumour of the Womb, operated on under the Spray. By William Goodell, M.D., Professor of Clinical Gyneecology in the University of Pennsylvania.	377
IV. Treatment of Pertussis by Inhalation. By J. Lewis Smith, M.D., Clinical Professor of Diseases of Children in the Bellevue Hospital Medical College, New York.	386
V. How long may a Fœtus live in Utero after the Death of its Mother? By Robert P. Harris, A.M., M.D., of Philadelphia.	389
VI. On Contusions of the Cranial Bones. By John A. Lidell, A.M., M.D., of New York, late Surgeon of Bellevue Hospital, Inspector of the Medical and Hospital Department of the Army of the Potomac, etc. etc.	398
VII. Two cases of Clonic Blepharospasmus as Traumatic Reflex Neurosis. By F. C. Hotz, M.D., Ophthalmic Surgeon to Illinois Charitable Eye and Ear Infirmary, Chicago, Ill.	434
VIII. The Paths of Conduction of Sensory and Motor Impulses in the Cervical Segment of the Spinal Cord. By Isaac Ott, M.D., and Robert Meade Smith, A.M., M.D., Demonstrator of Experimental Physiology in the University of Pennsylvania.	438
IX. Observations on Infiltration of the Retina in Lardaceous Disease of the Kidneys due to Chronic Suppuration from Bone Disease. By Charles Stedman Bull, A.M., M.D., Surgeon to the New York Eye Infirmary.	445
X. Case of Hysterical Tetanus. By D. Webster Prentiss, M.D., Professor of Materia Medica and Therapeutics, National Medical College, Washington, D. C.	451

ART.

PAGE

XI. Dislocation of the Hip in Children: a Report of two Cases with Remarks. By V. P. Gibney, A.M., M.D., of the Hospital for the Ruptured and Crippled, New York.	453
XII. A Contribution to the Study of True Adenoma of the Mamma. By Samuel W. Gross, A.M., M.D., Surgeon to the Jefferson Medical College Hospital, and to the Philadelphia Hospital.	459
XIII. A Case of Ruptured Womb, followed by Abscess, and Ultimate Recovery. By B. M. Badger, M.D., of Wright's Bluff, South Carolina. . .	468

REVIEWS.

XIV. National Public Health Legislation.

1. Reports and Resolutions relating to Sanitary Legislation. Presented to the American Public Health Association at its meeting in Richmond, Va., November, 1878. 8vo. pp. 23. Cambridge, 1878.	
2. A Bill to Establish a Department of Public Health, offered by Mr. Lamar, Dec. 10, 1878 (S. 1462), 45th Congress, 3d session.	
3. Memorandum of the American Public Health Association on Legislation Affecting Public Health.	
4. Proceedings of the Board of Experts authorized by Congress to investigate the Yellow Fever Epidemic of 1878, meeting held in Memphis, Tenn., Dec. 26, 27, 28, 1878. 8vo. pp. 21. New Orleans, 1878.	
5. Circulars of the National Board of Health, Washington, D. C. 8vo., Nos. 1, 2, and 3. April 7, 1879.	
6. National Board of Health Bulletin. Nos. 1-7, 1879.	471

XV. Lessons in Gynecology. By William Goodell, A.M., M.D., Physician-in-Charge of the Preston Retreat, Professor of Clinical Gynecology in the University of Pennsylvania, etc. 8vo. pp. 380. Philadelphia: D. G. Brinton, 1879.	480
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XVI. La Trépanation Guidée par les Localisations Cérébrales. Par le Dr. Just Lucas-Championnière, Chirurgien des Hôpitaux de Paris, Membre de la Société de Chirurgie. 8vo. pp. 150. Paris: Delahaye & Co., 1878. Trehilning Guided by Cerebral Localization. By Dr. Just Lucas-Championnière.	489
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1. Della Amputazione Utero-ovarica come Complimenta di Taglia Cesaro pel Dottor Edoardo Porro, Professore Ordinario di Ostetricia e Ginecologia nell' Università di Pavia.	
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ART.	PAGE
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XX. The Brain and its Diseases. Part 1. Syphilis of the Brain and Spinal Cord, showing the part which this agent plays in the production of Paralysis, Epilepsy, Insanity, Headache, Neuralgia, Hysteria, Hypochondriasis, and other Mental and Nervous Derangements. By Thomas Stretch Dowse, M.D., F.R.C.P.E., Physician to the North London Hospital for Consumption and Diseases of the Chest, etc. etc. 8vo. pp. 142. London: Balliere, Tindall, and Cox. New York: G. P. Putnam's Sons, 1879.	510
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1. Tenth Annual Report of the State Board of Health of Massachusetts. Jan. 1879. 8vo. pp. 309. Boston, Mass., 1879.	
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XXVII. Transactions of State Medical Societies.	
1. Transactions of the Ohio State Medical Society. May, 1878, pp. 228. Columbus, Ohio, 1878.	
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ART.

PAGE

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XXX. On Regressive Paralysis (Infantile Paralysis. Spinal Paralysis of Adults). By William H. Barlow, M.D. 8vo. pp. 88. Manchester: J. E. Cornish, 1878.	534
XXXI. Die Hautkrankheiten für Aerzte und Studirende dargestellt von Dr. Gustav Behrend, praet. Arzte in Berlin. Mit 28 Holzschnitten. 12mo., pp. 569. Braunschweig. Verlag von Friedrich Wreden, 1879. Skin Diseases Described for Practitioners and Students. By Dr. Gustav Behrend, etc.	535
XXXII. A Manual of Midwifery for Midwives and Medical Students. By Fancourt Barnes, M.D. Aber., M.R.C.P. Lond., Physician to the General Lying-in Hospital, and to the British Lying-in Hospital, etc. etc. 12mo. pp. 201. Henry C. Lea, Philadelphia, 1879.	537
XXXIII. American Health Primers. 32mo. Philadelphia: Lindsay & Blakiston, 1879.	
1. Hearing, and How to Keep It. By C. H. Burnett, M.D. Pp. 152.	
2. Long Life, and How to Reach It. By Joseph G. Richardson, M.D., Professor of Hygiene in the University of Pennsylvania, etc. etc. Pp. 160.	
3. The Sumner and Its Diseases. By J. C. Wilson, M.D., etc. etc. Pp. 160.	537
XXXIV. Pott's Disease, its Pathology and Mechanical Treatment, with Remarks on Rotary Lateral Curvature. By Newton M. Shaffer, M.D., Surgeon in Charge of the New York Orthopaedic Dispensary, etc. 12mo. pp. 82. New York: G. P. Putnam's Sons, 1879.	539
XXXV. Clinical Lectures on Diseases Peculiar to Women. By Lombe Athill, M.D., Univ. Dub., Master of the Rotunda Hospital, Dublin; Consulting Obstetric Surgeon of Adelaide Hospital, etc. Fifth edition, revised and enlarged. 12mo. pp. 342. Philadelphia: Lindsay & Blakiston, 1879.	540
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XXXVIII. Etiologie et Pronostic de la Glycosurie et du Diabète, par le Dr. Jules Cyr. 8vo. pp. 172. V. Ad. Delahaye et Cie. Paris, 1879. .	542

QUARTERLY SUMMARY

OF THE

IMPROVEMENTS AND DISCOVERIES IN THE
MEDICAL SCIENCES.

ANATOMY AND PHYSIOLOGY.

PAGE	PAGE
Inequality in Length of Lower Limbs. By Dr. J. G. Garson. 543	The Duplication of the Functions of the Brain. By M. Luys. . 543

MATERIA MEDICA AND THERAPEUTICS.

Menthol : a New Antiseptic.	544	Nitrite of Amyl. By Dr. Gaspey. 547
Pelletierine as an Anthelmintic.	545	Quebracho, a Palliative Remedy in Dyspnœa. By Dr. F. Penzoldt. 547
On the Effects of Chloroform, Ethidene, and Ether, on Blood-pressure. By the Committee on the Action of Anaesthetics of the British Medical Association	545	Inhalation of Eucalyptus Oil. By Dr. Mosler. 548
		Mode of Action of Iron in Chloroanaemia. By Dr. Hayem. 549

MEDICINE.

Treatment of Acute Rheumatism by Salicin and Salicylic Acid. By Dr. T. J. MacLagan.	550	Multilocular Pleurisy. By M. Jacob. 561
The Influence of Treatment on the Course of Rheumatic Fever before and since the employment of Salicylic Acid. By Dr. William Squire.	551	Cases of Phthisis treated at High Altitudes. By Dr. C. Theodore Williams. 564
Recent Observations on Mumps. By Drs. Pinet, Penzoldt, and Testa	553	The Seat of the so-called Anæmic Bruit of the Cardiac Base. By M. Constantin Paul 565
Study of Epidemic Cerebro-Spinal Meningitis. By Dr. Frey.	555	Sounds and Bruits of the Heart and the Aorta, which can be heard at a certain distance from the Patient. By Professor Ebstein. . 566
Tubercular Meningitis in Childhood. By Henoch.	556	On Traumatic Ruptures of the Heart. By M. Terrillon. 566
Hysterical Hemianæsthesia in a Man. By Prof. Ball.	556	Complete Occlusion of the Vena Cava Inferior with Malignant Disease of the Liver. By Dr. Little. 568
Undescribed Cause of Reflex Vertigo. By Dr. Erlenmeyer.	557	Two Cases of Perforation of the Oesophagus. By Dr. Lesser. . 568
Chorea, a Functional Disorder. By Dr. Octavius Sturges.	557	Case showing peculiar Auscultatory and Percutatory Gastric Phenomena. By Herr Strampell. . 569
Hypodermic Use of Fowler's Solution in Chorea. By Dr. Perroud. 559		Inflammatory Fungoid Neoplasm. By Dr. Dühring. 570
Salicylate of Soda in Chorea. By M. Dresch.	560	The Use of Iodide of Starch in the Treatment of Lupus Erythematodes. By Dr. McCall Anderson. 570
Subcutaneous Injection of Ergot in Neuralgia. By Marino.	560	A Rare Nodose Condition of the Hair. By Dr. Walter G. Smith. 571
Laryngeal Phthisis: its Origin, Course, and Termination. By Dr. Morell Mackenzie.	560	

SURGERY.

PAGE		PAGE	
Antiseptics on the Battle-Field. By Profs. Esmarch and Paul Brüns.	571	Lithotrity at a Single Sitting. By Sir Henry Thompson.	578
Catgut as a Source of Infection. By Prof. Zweifel.	573	Villous Disease of the Bladder. By Dr. Robert S. Hudson.	579
Treatment of Cancer of the Thyroid Body. By Dr. C. Kaufmann.	573	Lymphadenoma of the Testis. By Profs. Monod and Terrillon.	579
Excision of Pylorus. By M. Péan.	575	Etiology of Hip-Joint Disease. By Mr. Richard Barwell.	580
Extrication of a Floating Kidney. By Dr. A. W. Smyth.	575	The Disturbance in the Growth of the Long Bones after Necrosis of the Diaphysis. By Prof. Hel- ferich.	581
On an Operation for the Relief of Patients who Suffer Severely from Long-standing Hypertrophy of one Prostate, or from Vesical Tumour, with Retained Urine. By Sir Henry Thompson, Dr. Keyes, and Mr. Teevan.	577	Reproduction of the Tibia after Osteomyelitis. By Prof. Wein- lechner.	582
Ophthalmic Migraine. By Dr. Galezowski.	583	Fracture of the Coracoid Process. By Dr. Edward C. Huse.	583

OPHTHALMOLOGY AND OTOTOLOGY.

Ophthalmic Migraine. By Dr. Galezowski.	583	Reflex Action in the Organ of Hearing. By Dr. Weil.	584
--	-----	--	-----

MIDWIFERY AND GYNÄCOLOGY.

Action of Pilocarpine on Uterine Contractions. By Dr. Marti.	584	Ergot. By Dr. G. Ernest Her- man.	586
Use of Benzoate of Soda in Puer- peral Fever. By Lehnebach.	585	Oöphorectomy in a case of Con- genital Vaginal Defect. By Prof. von Langenbeck.	586
Laceration of the Cervix Uteri. By Dr. Spiegelberg.	585	The Treatment of the Pedicle in Ovariectomy. By Prof. Spiegel- berg, and Dr. F. Saltzman.	586
Treatment of Uterine Fibroids by			

MEDICAL JURISPRUDENCE AND TOXICOLOGY.

Antidotes for Strychnia. By Dr. Husemann.	587	Treatment of Strychnia Poisoning. By Rivine.	588
--	-----	---	-----

AMERICAN INTELLIGENCE.

ORIGINAL COMMUNICATIONS.

Case of Gunshot Wound of the Heart; Death on the Thirteenth Day. By H. W. Boone, M.D., Resident Physician at the City		and County Hospital, San Fran- cisco, California.	589
		Case of Fracture of the Third Cer- vical Vertebra. By H. F. Eber- man, M.D., of Lancaster, Pa.	590

OBITUARY NOTICE.

GEORGE B. WOOD, M.D.	591
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THE
AMERICAN JOURNAL
OF THE MEDICAL SCIENCES
FOR OCTOBER 1879.

ARTICLE I.

ON PHANTOM STRICTURE AND OTHER OBSCURE FORMS OF RECTAL DISEASE. By W. H. VAN BUREN, M.D., Professor of Surgery in Bellevue Hospital Medical College, New York.

THE causes of stricture of the rectum are recognized by practical surgeons as often obscure, and the difficulties which surround its diagnosis are in many cases apparently insurmountable. Hence the unsatisfactory results which so often attend the treatment of this disease. But if in the rarity of well-observed cases of a disease which is by no means of common occurrence, and in the conflict of opinion as to the part played by the several venereal diseases in its causation, our etiological knowledge is still vague and advances but slowly, surely the great advantages derived of late years from the use of anæsthetics and other aids to exploration should be by this time bearing some fruit, at least in diagnosis, and in dispelling old errors which complicate the subject and add largely to its difficulties.

The following cases and remarks are offered in the hope of throwing some light upon these obscure questions, and, even if they fail in this object, of attracting attention to a class of cases in which greater certainty of knowledge promises to save much human suffering, both of mind and body.

By the term phantom stricture is meant the presence of rational signs, and often of fallacious physical signs, of organic stricture, causing belief in the existence of the disease in a case in which it is in reality non-existent.

In discussing the subject of stricture of the rectum, the question as to the importance of *muscular spasm*—whether it is capable alone of constituting stricture, or of causing or of complicating true organic stricture—

presents itself at the outset as a source of uncertainty. The term spasmodic stricture has a certain vagueness, as employed in surgical technology, which I desire to get rid of, and to this end I shall assume, in accordance with most recent authorities, that neither in imaginary nor in actual stricture of the rectum is muscular spasm an element of any real practical importance. As regards the œsophagus, the urethra, and other canals with muscular walls, this assertion might be perhaps difficult to justify; and the older writers have taken advantage of the analogy to assume, without adequate proof, the existence of spasmodic stricture of the rectum. But, by the aid of anaesthetics, this has been demonstrated to have a very doubtful existence, except perhaps as an epi-phenomenon or additional feature of organic stricture. No modern authorities admit the existence of pure spasmodic stricture of the rectum, except in its lowermost portion, where it is surrounded by the external sphincter. Muscular spasm may, therefore, be considered as excluded in studying the causes of phantom or imaginary stricture of the rectum.

This singular affection will be found in most cases to take its origin in the constipation and difficulty of defecation so common in dyspeptic and hypochondriacal subjects; and the idea thus begotten of the existence of a physical obstacle in the lower bowel is too often confirmed by some professional opinion, based neither on careful physical exploration nor on full practical knowledge. The obstruction almost certain to be encountered when a bougie is inserted into the rectum, from contact with a fold of the gut or with the promontory of the sacrum, is accepted as evidence of stricture; the novelty and simplicity and apparent effectiveness of the manœuvre please the patient; the impression produced upon the lower bowel provokes a fuller stool; and, when the bougie possibly enters more freely than usual, it is assumed that "the spasm is giving way." As an imaginary stricture is always located beyond the reach of the finger, a prompt demonstration of its non-existence is not easily arrived at; and the arrest of the bougie by the promontory of the sacrum has a singularly convincing effect upon the mind of the patient and of the physician. The invalid who once fairly enters on this vicious circle is therefore likely to travel in it indefinitely, for imaginary diseases are notoriously slow in getting well. The case recorded by Syme is worthy of repetition in this connection; it is authentic, bears directly on the point which I desire to make, and will always possess interest as a beacon against error. Like the legal cases admitted as precedents, it should be held in memory.

CASE I.—He introduces the case¹ as "an elderly lady whom I saw with Dr. Begbie." She had been supposed to suffer from stricture of the rectum between five and six inches up the gut, and had been subjected to treatment for it, during several years, before coming under Dr. Begbie's care, "by two gentlemen of the highest respectability in this city. Finding that the coats of the rectum, though greatly dilated, were quite smooth and apparently sound in their texture, so far

¹ Syme on Diseases of the Rectum, Edinburgh, 1838.

as my finger could reach, and conceiving that the symptoms of the case denoted a want of tone or proper action rather than mechanical obstruction of the bowels, I expressed a decided opinion that there was no stricture in existence. Not many months afterward the patient died, and, when the body was opened, not the slightest trace of contraction could be discovered in the rectum or any other part of the intestinal canal. One of the gentlemen who had been formerly in attendance was present at this examination, and, wishing to know what had occasioned the deception, which he said had led to more than *three hundred hours* being spent by himself and his colleague in endeavours to dilate the supposed stricture with bougies, he introduced one, as he had been wont to do, and found that upon arriving at the depth it used to reach its point rested on the promontory of the sacrum."

The following case, which occurred many years later in another hemisphere, is an example, apparently, of similar self-deception.

CASE II.—Mr. J. E., a dyspeptic middle-aged banker, from a western State, consulted me in 1854 in consequence of the drudgery to which he was subjected in being compelled to introduce a bougie into his rectum every other day for half an hour "for a stricture;" and without this manœuvre he said he was unable to get a passage from his bowels. He had been pursuing this practice for nearly three years in consequence of advice received from more than one highly respectable professional source, and he was anxious for more effective and radical treatment. There was no stricture within reach of the finger, nor could I discover any evidences, rational or physical, of obstruction higher up, and, finding that his favourite bougie (for he had quite a collection of them) penetrated no further than my finger had reached, I suspected that the instrument was simply acting as a suppository in provoking action of the bowels, and that the real difficulty in defecation consisted in want of natural action arising from other causes. I encouraged the patient therefore to adopt a more rational and varied diet and a less sedentary life, and induced him, not without some difficulty, to discontinue the bougie. Mr. E. gradually became reassured, and adopted my opinion and suggestions. He subsequently took up his permanent residence in this city, and has since been uninterruptedly under my observation, but has never had any return of symptoms suggestive of stricture of the rectum.

But the promontory of the sacrum is not the only source of possible deception when the rectum is explored by a bougie beyond the reach of the finger. The walls of the rectal pouch tend to fall into loose folds when empty, and they present also certain slight permanent partial constrictions or narrowings. The uppermost one of these corresponds with the level at which the rectum gets its complete peritoneal investment. A normal narrowing at this point had been already frequently recognized, and the fact has been confirmed, by good observers, in the experiments in manual exploration recently practised upon the rectum.¹

Other writers have described slighter and more or less constant permanent narrowings at and below this point of the rectum as a "third sphincter," and, in fact, have cumbered the archives of surgery with a good deal of fruitless speculation concerning an organ to which anatomy and physi-

¹ See article by Mr. Walsham in the last edition of Holden's Landmarks, p. 70, London, 1876.

ology have been equally unsuccessful in assigning either certainty of location or certainty of function. Dr. Chadwick, of Boston,¹ has shown by his own and other recent researches, that all the so-called "internal sphincters" of the rectum, including the upper band of circular fibres spoken of as a "third sphincter," and differently described by Velpeau, Nélaton, and Hyrtl, are simply bundles of ordinary muscular fibres of the intestine, differing from each other only in volume and power, and that their function is *not to obstruct the gut and arrest its contents*, but, like all other circular intestinal fibres, *to urge by their peristaltic contractions the contents of the bowels onwards*. He demonstrates that the true and only power of arrest resides in the external voluntary *sphincter ani*, aided by the perineal muscles; that the bundles of *involuntary* fibres, if entitled to any special designation, should be called "detrusors" and not "sphincters;" that they form a part of the apparatus by which peristalsis is effected, and that for this purpose they are under central control, being stimulated by the vagus, and inhibited by the splanchnics, dilating and contracting with a certain rhythmical precision under the reflected stimulus of fecal distension.

For our present purpose Dr. Chadwick's researches concerning the "so-called internal sphincter" suggest two practical deductions: first, that the uppermost of these heavier bundles of involuntary fibres, especially when it forms a sort of upper limit to the rectal pouch posteriorly, often corresponds with a projecting fold of the rectum, and is liable to offer an obstacle to the passage of the bougie, and thus to simulate a stricture;² second, that the nerve force which presides over the rhythmical contractility of the unstriped muscle of the intestinal walls is liable, under morbid influences, to diminish or to fail, and that atony of the *detrusor* muscular apparatus is a not uncommon cause of the difficulty in defecation which is ascribed to stricture. I would remark also, by way of enforcing the importance of the latter deduction, that the evolution of gases and their absorption by the intestinal surface are phenomena admitted to be due to disturbed—generally defective—nerve power; so, also, is the diminished follicular secretion of lubricating mucus, causing unnatural dryness of these surfaces; and that these conditions, which often accompany, if they do not actually cause, failure in function on the part of the large bowel, are remediable in most cases by rational therapeutics.

CASE III.—Gen'l D., æt. 47, a fine-looking man, of good constitution, married, habitually overworked in railroad management in the West, came to the city in March, 1877, in search of relief from a difficulty in defecation, from which he had suffered for ten years; speaking of his malady as a "stricture of the rectum," which, he had been told, existed at five inches from the anus. In a note of his case taken by my associate, Dr. Keyes,

¹ Gynæcological Transactions, vol. ii. 1877.

² Dr. C. himself testifies: "This obstacle I have repeatedly met during the past two years, and erroneously supposed to be the projecting promontory of the sacrum."

the rectal trouble is referred to as "chronic diarrhoea and dysentery with ulceration of the lower bowel during service in the army from 1861 to 1865, the symptoms gradually assuming an obstructive character." The stools were scanty and difficult, "pipe-stem" in size, never secured without a previous enema; "chunks of feces" and "wads of pus" are spoken of as sometimes expelled. The diagnosis of stricture made, according to the patient, in Chicago, Ill., in 1868, was afterwards confirmed by Dr. Van Buren in N. Y., who advised a trip abroad; by Nélaton and Dolbeau who were consulted in Paris, and afterwards by Hamilton, of Dublin. All advised continuance in the use of bougies, declining to operate so high up. In despair of recovery he now revisits New York, determined to have an operation performed for his relief.

The patient was accordingly etherized for thorough exploration, and, after stretching the sphincter, a rectal caoutchouc bougie of the largest size was passed ten inches into the bowel without difficulty. On withdrawing the bougie after largely inflating its terminal bulb, the latter was slightly obstructed by what seemed to be a muscular band at about five inches. As far as could be ascertained by inspection, this band was not cicatricial, there was no evidence of the previous existence of any ulcer at the spot, and the mucous membrane above it was healthy. To remove all doubt I felt justified in requesting Dr. Keyes to introduce his hand, which measured nine inches around, into the rectum. It passed readily through the supposed stricture, and into the sigmoid flexure. The muscular band was recognized, but yielded with the slightest resistance. It was situated at the upper limit of the rectal pouch, about on a line with the reflexion of the peritoneum. The patient was somewhat sore for a day or two, but suffered no serious harm from the exploration.

I was struck by one of Gen'l D.'s reminiscences, which occurred to him in the effort, apparently, to reconcile himself to the conclusion which I was enforcing that he certainly had no stricture. "Well," said he, "I remember thinking how strange it was that when I was camping out during the grouse-shooting season I could always go out in the bush and get a good satisfactory stool every morning."

As he had derived positive benefit for the time from his former trip abroad, I advised him to cross the ocean again, to use a laxative pill containing the choleate of soda, and, when he returned to business, to interpolate as much grouse-shooting as possible.

I am indebted to Dr. Keyes for the record of the following case:—

CASE IV.—Rev. I. B., 41, unmarried, applied for relief in June, 1877, for stricture of the rectum high up. Thinks he has two strictures. Has been suffering from dyspepsia and constipation for fifteen years. Has used much medicine, and, by the advice of an irregular practitioner of much popular reputation in rectal diseases, has been introducing a large bougie six inches or more up the rectum four times a week, at intervals, for several years. Says, moreover, that his "stools are uniformly flattened," and that he voids an excess of rectal mucus.

No evidences of stricture could be found on the most thorough exploration.

This patient had suddenly taken to hard study in order to become a clergyman, after years of active and laborious life in another capacity in the open air; he has a marked gouty constitution, and inherits dyspepsia. He was disabused as to the existence of any strictures, advised more outdoor life and a laxative pill, as in the last case. Some time afterwards a

grateful letter was received from Mr. B. announcing a decided change for the better.

The terms "pipe-stem," "flattened," and "tape-like," as applied to the appearance of stools, and also the expression "wads of pus," suggest two common sources of error in diagnosis; for these appearances do not necessarily mean stricture, nor even ulceration looking to subsequent stricture; and as in the cases just detailed they may be entirely delusive. In true stricture the feces, when solid, are in small lumps, resembling sheep-dung. An elongated mass must necessarily take its shape and size from the orifice of the anus, through which it is last extruded. The only exception to this is when the sufferer, by extreme straining, has forced his stricture far enough through the anal opening to get its own final imprint upon the extruded material; and this I have known to occur. Then, again, it is a very common occurrence for a victim of fancied rectal disease to report the daily evacuation of pus, which, on inspection, is found to be simply the normal jelly-like rectal mucus, which is always stained more or less deeply yellow by the bile in the feces. This mucus, especially where efforts at stool are frequent, is always more liberally secreted, and its quantity always greater, than is generally supposed. Moreover, this pus-like material is often streaked with blood, or accompanied by positive hemorrhages from hemorrhoidal congestion aggravated by straining. These appearances are very likely to suggest the presence of serious disease to any anxious patient who watches himself too closely.

Quain, who says he has "known repeated instances in which the bougie had been passed at short intervals for supposed or imputed stricture, where none had ever existed,"¹ quotes the following case:—

"A medical practitioner under Dr. Burne's care for broken health from excess and irregular habits, was persuaded by a surgeon that his ailments were due to stricture of the rectum, although his bowels acted regularly every day, and, contrary to the advice of his physician, he submitted to treatment with a bougie, but, after some months' trial, became convinced of its uselessness, and gave it up. On dissection of the body, which was made not long after, 'no stricture nor trace of stricture could be discovered, either in the rectum, colon, or intestinal canal.'"²

Finally, medical men, even where their own sensations are in question, are liable to deceive themselves. Obviously there is no lack of evidence that honest men may fall into error as to the existence of stricture of the rectum. Many cases like those first recorded have doubtless never seen the light. Moreover, patients often manifest a singular facility, with which practical men are familiar, for being persuaded of the actual existence of disease which is entirely imaginary; and, unhappily, there are amongst those to whom patients appeal, men who do not scruple to take advantage of their credulity. But there are also, I am convinced, many

¹ Diseases of the Rectum, by Richard Quain, F.R.S., N. Y., 1840, p. 219.

² A Treatise on the Causes and Consequences of Habitual Constipation, Reprint, N. Y., 1840, p. 149.

well-read practitioners who have been led into error by the common but vaguely expressed belief in "spasmodic stricture" of the rectum, implied rather than openly defended, by many good English authors. As I have, perhaps, passed over this point in too summary a manner, I will discuss more fully the considerations which have led me to believe in the non-existence of obstruction in the rectum from this cause; for the idea of spasm as a cause of stricture of the rectum has secured such a degree of favour in the professional as well as in the popular mind—as in the case of the urethra—that the simple assertion that it is not admitted by modern authorities, may not be accepted as final.

The fanciful theory that spasm of the voluntary muscle surrounding the membranous urethra comes by reflex action from organic stricture formed nearer to its meatus, which has been made the basis of so much doubtful practice in this country, is, happily, for anatomical reasons, not applicable to the rectum.¹ But in the earlier half of this century a similar delusion as to the great frequency of rectal stricture, its origin in spasm, and its curability by the bougie, was so prevalent in England that the fear of this disease grew to be a national peculiarity. It was, in fact, an example of the "epidemic terror" which Goldsmith had described in the *Citizen of the World* as one of the peculiarities of his countrymen, and which was prevailing at the time he wrote in the form of a dread of mad dogs.²

A recent French³ author repeats an illustrative story of a lady in London who, recommended to a specialist for costiveness, was examined with a bougie and pronounced strictured. Her husband, surprised and angry at the liberty taken with his wife, rushed off with a horse-whip to the house of the offender, but came home again after a little to his anxious partner confessing that he had grievously wronged a most worthy gentleman. The specialist had not only satisfied him as to the certainty of the lady's malady, but had proved, by inserting a bougie, that he also had a

¹ It is more than probable that Verneuil had thought out the possibility of strengthening this theory, which he was disposed to defend, by analogy with the rectum, for, in a discussion on the etiology of rectal stricture at the Surgical Society of Paris, he mentions how he thinks valvular or thin-edged strictures form near the anus, viz.: by spasmodic contraction of the upper fibres of the external sphincter provoked by ulcer or fissure below, at the verge of the anus, which thus leads to a permanent thread-like contraction. But he goes no further than the external sphincter, as his words show: "un chancre, une ulcération anale se produit, une fissure lui succède,—puis la contracture du sphincter. Le rétrécissement finit par être constitué par les fibres supérieures du sphincter, qui forment une véritable valvule."—*Bull. de la Soc. de Chirurg. de Paris*, 1873, p. 12.

² "The English people," says Goldsmith, "are afflicted it is true with neither famine nor pestilence, but then there is a distinct disorder, peculiar to the country, which every season makes strange ravages among them; it spreads with pestilential rapidity, and infects almost every rank of people; what is still more strange, the natives have no name for this peculiar malady though well known to foreign physicians by the appellation of epidemic terror."—*Citizen of the World*, Letter 69.

³ Mollière, *Traité des Maladies du Rectum*, Paris, 1877, p. 320.

stricture. Horace Walpole furnishes similar evidence in one of his letters. He warns a friend, who is about going to Bath for his health, not to fall into the hands of a notorious practitioner of that place who always found his patients affected with contraction of the lower bowel and set them to introducing bougies. His friend in response warns Walpole not to joke about serious matters, for he had already consulted Mr. ——, who had actually found an obstruction in his bowel that caused all his symptoms, and that he was already getting better under Mr. ——'s skillful use of an instrument which he was inserting daily.

Marshall Hall in one of his published lectures¹ relates the case of a young medical friend who had been nine weeks under his roof, and in whom he had never suspected any disease of the bowel, who went to Bath and met there a young surgeon who passed a bougie and fancied he discovered stricture of the rectum. The bougie was inserted daily for several weeks, causing much pain and irritation. Dr. Hall subsequently took his friend to Sir Charles Clark, an eminent surgeon of that day, who examined him and found no stricture. The bougie was relinquished, and from that time "the factitious disease of the rectum, for such it was, was forgotten."

It is a remarkable fact that there is little if any evidence concerning either spasmotic or fancied stricture of the rectum to be found in the surgical literature of the Continent. The Germans and French scarcely allude to spasm, except as a complication of organic narrowing, and then with no emphasis or precision; and by the latest French authorities, Mollière² and Trélat, the existence of pure spasm as a cause of rectal stricture, except where the gut is in the grasp of the external sphincter, is formally denied.

But by English authors the subject is handled with less decision. One of the most recent and best of them, Mr. Allingham, bases an opinion as to the frequent presence of spasm, *as complicating organic stricture*, upon the most positive clinical experience I have found recorded anywhere.

"There are, no doubt," says he, "many cases of stricture in which there is very little deposit and much spasm; and there are, on the other hand, cases where much obstruction exists but very little spasm. A patient under my care at St. Mark's had a stricture so tight that I could not make the point of my little finger enter it; on putting her under the full influence of chloroform I could get two fingers through without difficulty."³

Admitting, not without some hesitation, Mr. A.'s first allegation, which is possibly somewhat influenced by English traditions, I am forced to confess that I have never felt any rectal stricture like that of this woman, and should suspect the presence of hysteria in the case, for it would seem that an exception to the rule ignoring pure spasmotic stricture must be made

¹ Lond. Med. Gaz., 1837-38, vol. i. p. 40.

² Art. Rectum in *Dictionnaire Encyclopédique*, by Trélat and Delens.

³ Fistula, Haemorrhoids, Painful Ulcer, Stricture, Prolapsus, and other diseases of the Rectum, their diagnosis and treatment, by William Allingham, etc. etc., 2d ed., Phila., 1873.

in favour of this extraordinary disease, which so often defies all our rules. I have seen continuous spasm of the *voluntary* muscles of the leg and foot simulating well marked talipes varus in a hysterical young woman, which disappeared under the influence of chloroform, but always returned. She ultimately submitted to division of the tendo Achillis in one of our hospitals, on which the local malady returned no more. Are we justified in assuming that similar continuous spasm of *involuntary* muscle may exist? Jaccoud records a case of fecal vomiting which occurred in his wards at the Lariboisière, in 1867, in a young woman who was admitted with hysterical convulsions. For eight days this person, after the convulsions ceased, at least once, sometimes twice, in the twenty-four hours, vomited veritable feces, dense, solid, cylindrical, of a brown colour, and with the normal fecal odour, coming evidently from the large intestine. Jaccoud witnessed the act himself, and so also did Dieulafoy, his *interne*, and he characterizes it as actual defecation by the mouth. Apart from the passing disgust which followed the act, the patient ate as usual, and continued in her ordinary health, except in the absence of normal action of the bowels. At the end of the eighth day the hysterical convulsions returned, and, coincidentally, the feces resumed their natural route. All possibility of deception seems to have been rigorously excluded. Within a fortnight this woman was seized with grave typhoid fever, and died. Careful examination of the body disclosed no mechanical obstruction whatever in the intestinal canal. The ileo-cæcal valve was normal.

Jaccoud concludes from this case that the ileo-cæcal valve may be forced, and true stercoraceous vomiting take place, and that occlusion by pure intestinal spasm—the *passio iliaca* of the ancients—is a reality; but he knows of no recorded instance of its occurrence in a male, and believes that it is only possible in a hysterical woman, and that even this is excessively rare. He considers also that this case demonstrates the possibility of reversed or anti-peristaltic contractions of the intestinal muscles, and with sufficient force to produce vomiting of feces.¹

Allingham,² it will be noticed, distinctly refrains from asserting the existence of stricture from spasm alone; it must be associated, he assumes, with some organic change in the walls of the bowel. Curling³ is silent on this topic. Quain,⁴ elsewhere so judicious in his method of handling his subject, is singularly unsatisfactory in his remarks on spasmodic contraction of the bowel. His cases (86, 87, and 88, p. 299) are fair examples of what I have called phantom stricture, and are entirely inconclusive as regards spasm as the cause of obstruction.

But, amongst the English authors in the earlier part of the century, we

¹ *Pathologie interne*, 5th ed., Paris, 1877, vol. 2d, p. 271.

² See his last edition, London, 1879, p. 261.

³ *Observations on the Diseases of the Rectum*, 4th ed., Lond., 1876.

⁴ *Diseases of the Rectum*, reprint, New York, 1855.

find the possibility of pure spasmoidic stricture very positively asserted, notably by Travers, Howship, and O'Beirne, and, before them, by White, of Bath.

Travers, in his paper "On Local Diseases termed Malignant,"¹ under the head of "rectum," makes this passing remark: "Spasmoidic strictures are very common, particularly in women, and often mistaken; their feces, when solid, having the narrow, ribanded, and sharp-edged figure; they are curable by the temperate use of the bougie and cold-water clysters." This rather dogmatic utterance—the surgical style of the period—is evidently based upon cases, not too closely studied, of anal fissure causing spasm of the external sphincter, or of reflex uterine irritation—possibly hysteria.

Howship² asserts distinctly the existence of "permanent spasmoidic stricture of the colon," but gives no positive proof of it; and advocates as a remedy the very slow injection of some warm fluid into the bowel in large quantity. His first case (p. 12), in a boy of ten, was evidently one of invagination; a tumour, not fecal, could be distinctly felt in the left iliac region, and this tumour gave way and disappeared under the slow injection, and recovery followed. His other illustrative facts are equally inconclusive.

In his best case³ a stricture was found, after death, two inches in extent, with an opening scarcely admitting a goose-quill, situated about seven inches above the sphincter, in a man of 56, long ill with chronic diarrhoea, and described as dying finally of thoracic "inflammation." The colon was found largely dilated with soft feces. The rectum was at once removed, injected with a saturated solution of alum, and plunged into alcohol. In two weeks, when thoroughly hardened, "the feces were washed out, and a portion was cut out of its side above the contraction, to expose the healthy mucous membrane entering the stricture." The preparation was then mounted for the museum, as an undoubted specimen of "stricture from permanent spasm." He says, in describing it, that there is a "total absence of effused matter, intestinal deposit, or other effect of disturbed vascular action." But this specimen was not minutely studied when fresh; the constricted portion was not even laid open horizontally, and certainly not subjected to microscopic examination. I am forced to suspect that, in his anxiety to secure a good preparation for the museum demonstrating, as he thought, the truth of his preconceived theory of spasmoidic stricture—for which he had a remedy, *i. e.*, the prolonged injection of warm fluids, Howship involuntarily jumped at his conclusion. The evidence hardly justifies his assertion as to the total absence of interstitial deposit, and we cannot accept this very unlikely condition as proven. There

¹ Med. Chir. Trans., vol. xvii. p. 336, London, 1832.

² Practical Remarks on Spasmoidic Stricture, London, 1833.

³ Discretion and Appearances of Surgical Diseases, London, 1840, p. 242.

is no stronger proof of "permanent spasm" in any of Howship's cases than in this.

One of the most candid and able of the English authorities who wrote about this time, Herbert Mayo,¹ says of purely spasmody stricture, "the cases I have met with and have considered of this nature have been anything but satisfactory;" and, in confirmation of this opinion, he appends (p. 155) a description of one such case, which affords a good illustration of the vague and unscientific evidence on which the existence of an imaginary disease may be assumed to account for symptoms of intestinal torpor in a nervous dyspeptic; in short, it is an example of phantom stricture.

Bushe,² "after long doubt as to whether there was such an affection as functional or spasmody stricture of the rectum," at last met with two cases; one in "an exceedingly nervous lady," and another in a dyspeptic and costive gentleman. The strictures could only be felt when the patients were in the erect position, and bearing down forcibly. By this manœuvre he was enabled to insinuate the tip of his finger into a portion of the bowel "which was considerably contracted." Now, there is nothing easier, in my experience, than to get the sensation of entering a contraction with the end of the finger when it is being forced upward into the rectum whilst the patient is bearing down upon it. Anything short of a distinct grasping of the finger by a ring that embraces it firmly on all sides is likely to be illusory. One of Bushe's cases was cured by laxatives, and the bougie, in two months; and "the other recovered in three weeks," under the same remedies. I am unable to resist the suspicion that they were both phantom strictures.

Another writer who, by his plausible style and strong assertions, has aided largely in influencing professional opinion in favour of the belief in spasmody stricture of the rectum, and of the bougie as its remedy, is O'Beirne.³ This surgeon asserts that he "discovered," whilst treating tetanus by tobacco enemata, that the upper part of the rectum is "in a continual state of spasm;" and found, by subsequent experiment, that the rectum, as a rule, under all circumstances, so far from being open and relaxed, in accordance with common belief, is, on the contrary, habitually "firmly contracted and closed" (p. 4), especially at its upper extremity, where it joins the colon, at which point, he avers, there is a distinct *annulus*, or contraction, through which instruments pass "as if through a ring" (p. 7). He propounds the theory that the especial use of this "sphincter" is to resist the further progress of the feces which accumulate in their "natural reservoir, the sigmoid flexure," until the moment of defecation. He assumes, also, that spasm at this point is a common cause

¹ Observations on Injuries and Diseases of the Rectum, London, 1833.

² A Treatise on the Malformations, Injuries, and Diseases of the Rectum and Anus, New York, 1837.

³ New Views of the Process of Defecation, etc., by James O'Beirne, Dublin, 1833.

of constipation and obstruction, which is best remedied, at the moment, by the use of the long rectal tube, *which it is allowable to urge onward with some force, increasing the pressure gradually* "until such time as the resistance is completely overcome" (p. 58); and that it is to be permanently cured by the bougie. He maintains, also, amongst his new views, that the large bowel is mainly supplied by cerebro-spinal or voluntary nerves;¹ and that the rectum is always empty.

O'Beirne's views were ably disputed, shortly after their publication, by his countryman Bushe,² at that time a professor of anatomy in New York; but they have, nevertheless, secured a hold upon the profession and maintained it with singular tenacity. Even now it will be regarded as heretical to speak of them justly, although his unwise recommendation to overcome spasm by the forcible pressure of an instrument has undoubtedly led to fatal results, as in the case related by Dr. Burne in his *Treatise on Habitual Constipation*.³

O'Beirne, who was evidently a sanguine and impulsive man, maintains his "views" in the style of an advocate. He employs neither the accuracy of method, nor the calm, cautious judgment of the scientist, but assumes facts—many of which are false—and uses arguments, many of

¹ I prefer to reproduce some of O'Beirne's peculiar views and statements in his own language, and assume that it will be unnecessary to formally controvert them :—

"In examining the bodies of a considerable number of persons who died of tetanus . . . I have ascertained that the rectum at its uppermost part is marked by an exceedingly narrow tight neck or constriction perfectly free from all appearance or feel of structural alteration, . . . obviously exhibiting pure and unexceptional specimens, not only of spasmodie, but of permanently spasmodie stricture" (p. 31). At p. 21 he had already spoken of "the upper extremity or *annulus* of the contracted rectum;" and, at p. 29, he remarks that "it is self-evident that the uppermost part or *annulus* of this intestine" (the rectum) "is the only portion of it that can be said to be engaged in obstructing the exit, and resisting the weight, volume, and propulsion of the contents of the sigmoid flexure." . . . He argues "that the motions of the large intestines, contrary to the opinion generally entertained, are not of an involuntary nature, but placed directly under the influence of the will, and subjected to that of the great source of voluntary motion" (p. 19). He says (p. 8), "I have also examined the rectum of healthy persons . . . at the moment when they felt a moderate inclination to go to stool, and have ascertained that the rectum is in a perfectly empty and contracted state."

² Op. cit.

³ His friend Dr. Roots was called in great haste one morning to a gentleman in a state of partial collapse, suffering with violent abdominal pain. The surgeon in attendance reported that the symptoms arose from spasm, and informed the Doctor that the patient had two strictures of the rectum; that one had yielded; that the patient, having been out of town, had returned the previous evening, and that he, the surgeon, had endeavoured, as usual, to pass the bougie, but could not succeed on account of spasm of the gut; that he persevered, when, suddenly the patient complained of violent pain, and soon afterwards became alarmingly ill; that he had been with him all night and administered injections without avail; nothing except a little blood and mucus had been voided. The gentleman died during the day. The body was examined. A lacerated perforation of the rectum was discovered, with evidences of general peritonitis, but there was no stricture.

which are unsound, in support of a fancied discovery, and of a theory long since recognized as untenable. I need hardly add that his views are rejected by the best authorities at the present day.¹

But the English writer who seems to have done more than any other to establish a belief in spasmodic stricture of the rectum, is White, of Bath. His first publication, in 1809, was evidently inspired by the much quoted essay on "the scirrho-contracted reetum" of Sherwin, the earliest English writer on this subject.² White's second edition of his work³ (I have been unable to get access to a copy of his first edition) contains 28 cases of what he designates, after Sherwin, "scirrho-contracted" and "contracted" rectum. Of these, sixteen are within three inches of the anus, and two between three and four inches. In the effort to make out a distinction between malignant and benign strictures, a distinction which Sherwin had not recognized, White propounds a theory that there is a class of "simple strictures" which constitute the earliest stage of the "contracted rectum," in which, if discovered early enough, the disease is curable by the bougie. Taking the views of Everard Home on spasmodic stricture of the urethra, which have been long recognized as untenable, as his authority, he assumes a similar etiological origin for rectal strictures, which, he asserts, owe their existence, not to traumatism, nor to inflammatory or ulcerative changes in the mucous membrane of the bowel, but to *spasm* of its muscular coat, caused, in the first instance, by the contact of hardened feces in chronic constipation, and located, by preference, at or near the junction of the colon and rectum. These "simple strictures" are, therefore, beyond the reach of the finger, and recognizable only by the bougie, the use of which he also advocates very strongly as their proper remedy. "If," says he, "on introducing the finger, neither stricture nor induration can be discovered, a large-sized bougie must then be introduced and passed up as high as the colon, *which will be readily done if there be no obstruction in the passage*" (p. 26). Under the head of Treatment he says: "By degrees the bougie may be suffered to remain eight or ten hours at a time, with little or no inconvenience to the patient, and inserted daily" (p. 49). In a subsequent publication, entitled *Further Observations on Stricture of the Rectum, with Remarks on the Opinions of some late writers, etc.*, published also at Bath, in 1822, the tone of the writer is less modest and more polemical. This work contains evidence of successful practice in accordance with the new theory, in the form of assertions of great experience and skill in finding strictures in cases where

¹ "O'Beirne a decrit, sous le nom de sphincter supérieur, la portion de la couche de fibres circulaires que précède l'ampoule rectale, mais son épaisseur est trop faible pour qu'on puisse lui conserver ce nom qui se rattache, d'ailleurs, à une théorie de la défécation qui n'est plus admise."—E. Delens, *Dictionnaire Encyclopédique*, 3^e édition, t. ii. p. 672, Paris, 1874.

² Memoirs of the Medical Society of London, vol. ii. 1787.

³ Observations on Stricture of the Rectum, by W. White, M.R.C.S. Bath, 1815, 2d ed.

others had failed, and in a more confident style in answering objections raised against his theory and practice by "late writers." Thus, he criticizes Mr. Copeland and Sir Charles Bell for speaking doubtfully as to the diagnosis of strictures situated beyond the reach of the finger (p. 4); and derides Mr. Shaw for hinting that the promontory of the sacrum may be possibly mistaken for a stricture, clinching his position, in a rather triumphant tone, with the following query, as an *argumentum à posteriori*: "I should be glad to know why so many persons have been completely relieved from the most distressing symptoms by the use of the bougie, when all other means had failed, if no real obstruction had existed in the intestine?" Certain doubts expressed by "late writers" as to the great frequency of spasmodic stricture are answered by copious extracts translated from Boyer's famous essay on spasmodic contraction of the anus from fissure, which had appeared shortly before;¹ and White adroitly assumes that Boyer's array of facts and arguments concerning spasm of the sphincter ani confirm his own purely theoretical views as to the frequency of spasmodic stricture higher up in the bowel.²

White was evidently one of a type, of which we are rarely without instances in the profession, of men who are borne along by their own fancied discoveries to illogical conclusions, and who, like O'Beirne, whose theories were equally fanciful, serve only in the end to darken counsel by words of doubtful wisdom. He appears to have possessed little accurate clinical knowledge, but evidently much ability and great power of persuasion; and addressing the public rather than the profession in his writings, he secured a large following and, no doubt, much profit. Whilst we still recognize the traces of White's plausible but erroneous argumentation, the following quotations will explain why his views and opinions, once so popular, are now of no value, and why his name is so entirely lost to science:—

"It has so happened that in the course of an extensive practice very few cases of the simple form of constriction have occurred so low down in the rectum as to be within reach of the finger. And I can positively assert that the disease has been frequently overlooked, when the rectum has been subjected to an examination by the finger only. So seldom does simple stricture take place within reach of the finger, that on looking over a list containing one hundred and eighteen cases, I do not recollect meeting with half a dozen out of that number that were within reach. . . . It was, therefore the disease occurring so high up in the passage, connected with the circumstance of so many persons complaining of habitual costiveness from an early period of life, which induced me to think that

¹ In the *Journal Complémentaire des Sciences Médicales*, Nov. 1818.

² He pushes his assumption still farther; witness the following: "It does not, however, appear from the preceding observations of M. Boyer, that he had any idea of spasmodyc contraction of the anus being connected with stricture higher up the rectum, or occurring as a consequence of it; but he seems to consider it as a primitive affection. Whereas, in all the cases that have come under my notice, the complaint has always been attended by stricture some way higher up the rectum, except in one instance."—*Op. cit.* p. 32.

the passage might possibly, in such instances, be naturally too narrow, at some particular part, to allow the feces to pass with their natural freedom; and which might lay the foundation for the formation of stricture" (pp. 6 and 7).

The last paragraph is quoted, by the author himself, from a former edition, which explains the modesty of its style; but he assumes in the later publication that this theory has been amply confirmed by his statements and arguments, in despite of the objections raised by the "late writers."¹

Does not this curious vagueness, both in stating premises, and in reasoning from them, justify the suspicion that a very large proportion of White's "one hundred and eighteen cases" must have been phantom strictures?

Assuming a judicial position, and rejecting as far as possible all personal preconceptions and logical fallacies, we must admit, I think, that, except, perhaps, in certain rare forms of hysteria and, possibly, of cerebro-spinal lesion, there is no positive evidence of pure persistent spasm of unstriped muscle in any part of the intestinal canal. Those who hold the opposite have assumed its existence, as we have seen; they have not demonstrated it; consequently their opinions and deductions are based upon uncertain premises, and cannot be safely received.

As I have already intimated there is no serious writer on rectal stricture of recent date who formally maintains the idea of permanent spasm; its possibility is either absolutely rejected, or the subject is passed over in silence, as by Vincent, Sam. Cooper (1838), Nélaton (1859), Curling, Erichsen, Paget, and Gross, the last confining himself to the shrewd remark that "stricture is a disease much more frequently described than observed." The only exception I have discovered is Spence, of Edinburgh, who says:² "The rectum may also be spasmodically contracted at some point, and for the time this state presents all the symptoms of stricture;" but he adds, "this is not a stricture," it is "just a functional disturbance caused by some disease in the neighbourhood."

The absolute rejection of persistent spasm as a cause of stricture, comes mainly from the French and Germans; the traditional prejudice being still recognizable, I think in the English, amongst whom the best authorities, as we have seen, avoid the subject. Thus Mollière³ denies the existence of essential spasm except in the external sphincter. Trélat and Delens dismiss the question curtly, but courteously, with the remark that they are "disposed to dispute the existence of spasmodic strictures, notwithstanding certain English evidence in its favour."⁴ Leichtenstern decides that

¹ Lectures on Surgery, Edin., 1876, p. 1123.

² Maladies du rectum and de l'anus, Paris, 1877, p. 273. "En dehors de la maladie décrite sous le nom de fissure à l'anus, il n'y a pas de spasme essentiel de l'extrémité inférieure du tube digestif."

³ Pour qu'il y ait rétrécissement véritable du rectum il faut qu'il y ait diminution persistante du calibre de l'intestin par suite d'un épaississement ou d'une transformation de ses parois. Nous sommes d'après cela, disposés à contester l'existence du

"to-day the question of the existence of such an affection no longer calls for serious discussion."¹

This conclusion has been reached slowly, and by a road that is plain. After pathology had been securely placed on the basis of anatomy and histology, the traditional opinions founded upon clever speculations by ingenious theorists have been gradually dropped, and the more logical method of simple observations and deductions has been adopted. The author last quoted says of the etiology of ileus :—

"As a healthy logical need made itself felt, the need of bringing, in the simplest way, and without the aid of obscure hypothesis, clinical observations into agreement with the lesions found upon the cadaver, more and more light was thrown upon its nature."

What modern methods have taught us concerning spasm in connection with stricture may be finally summed up in a few words.

The normal rhythmical succession of relaxation and contraction of the intestinal unstriped muscular rings, which constitutes peristalsis, has been studied, by means of electricity, by Duchenne de Boulogne,² and by Onimus and Le Gros.³ They have established the possibility of local increase of intensity of muscular contraction, or tenesmus, and of local atony, or paralysis. Gowers,⁴ in a series of experiments upon a male patient in whom absolute paralysis of the external sphincter had followed a local injury impairing the action of the ano-rectal nerve centre, without involving the cord, or the unstriped muscle of the rectum, found that the rhythmical action of the latter could be provoked, with certainty, in a reflex way, and succeeded in getting traces, by means of a manometer attached to a caoutchouc tube containing a small tin pipe, through which air could be injected and peristaltic action excited at will, when the parts were previously quiescent. Goltz, of Strasbourg,⁵ felt the same rhythmical contractions in the dog, by means of the finger in recto, when cold water was suddenly thrown upon the animal's hinder parts. Dr. Chadwick, of Boston, who has studied the action of the so-called internal sphincter upon his own person, confirms these facts.⁶ Gerard,⁷ who has very recently

rétrécissement spasmodique, quoique H. Smith assure que le Musée de St. Bartholemew's Hospital renferme une préparation d'un rétrécissement du rectum dans lequel la coarctation porte sur une longueur d'un pouce et réduit à six ou sept millimètres le diamètre de l'intestin sans aucun épaississement des tuniques."—*Dict. Encyc. des Sciences Médicales*, 3me série, t. ii. p. 727, art. Rectum.

¹ Constrictions, Occlusions, and Displacements of the Intestines.—*Ziemssen's Cyc.*, New York, 1876, vol. vii. p. 484.

² De l'électrisation localisée et de son application à la pathologie et à la thérapeutique, Paris, 1861.

³ Traité de l'électricité médicale, recherches physiologiques et cliniques, Paris, 1872.

⁴ "The Automatic Action of the Sphincter Ani," by W. R. Gowers, M.D., Assist. Phys. to Univ. Coll. Hospital, communicated by J. Burdon-Sanderson, in *Proceedings of the Royal Soc.*, vol. 26, no. 179.

⁵ Über die Functionen des Lendenmarks des Hundes, Pfluger's Archiv, Bonn, 1874.

⁶ V. Trans. Gynaecolog. Soc., vol. ii. ut supra.

⁷ Des Corps étrangers du Rectum, Paris, 1879.

investigated the subject, says that the prolonged presence and pressure of a foreign body in the rectum may give rise to very powerful contractions capable of forcing the foreign mass upwards into the sigmoid flexure, even when the gut is over-distended by its bulk. This is directly inferable from the case of a prisoner in the galleys at Brest who died of acute peritonitis. At the autopsy there was found in the transverse colon a cylindrical conical box more than six inches long, five inches and a half in circumference, and weighing, with its contents (saws, files, money, etc.), nearly two pounds. It had been introduced through the anus, with its conical end upwards.¹ It would seem to be an established fact that, if introduced by its small end, a conical body will travel upwards—indefinitely; but if introduced with its base or large end upwards, it will remain in the rectum, whence it will be easily expelled. This is in accordance with what we know of peristaltic contraction.

These facts render us, to a certain degree, familiar with the mode of action of the unstriped muscular coat of the rectum, both in its normal state, and when abnormally excited; but they do not explain the possibility of stricture of the rectum from permanent spasm—for they confirm the law that relaxation must alternate with contraction. And here it is important to guard against the error of assuming that there is identity of action in the two kinds of muscle as regards the mechanism of this vital act. In the case of the young woman with hysterical talipes already mentioned, Brown-Séquard, who saw the case with me, explained the continuous spasmodic contraction in her leg muscles by the continued successive contraction and relaxation of the primitive fasciculi constituting the bulk of these muscles—as in normal muscular effort kept up in obedience to the will. In continuous spasm of the involuntary muscle of the intestine, can we correctly assume that the same mechanism is going on under the misplaced and perverted nerve force of hysteria? Physiology gives a negative answer to this question, for in unstriped muscle the stimulus to contract is not repeated in the same primitive fasciculus, save after a long interval of rest, but it is transmitted to the next succeeding fibres, so as to produce the characteristic vermicular motion of the intestine. Moreover, the fibres of unstriped muscle are not collected in masses, as in the voluntary muscles, but spread out in thin layers; and Matthias Duval² would seem to be justified in his recent assertion that tetanic spasm in unstriped muscle is an impossibility.

The question has been asked, How is it possible to demonstrate the existence of a persistent and purely spasmodic stricture? I know nothing that promises more than the test by anaesthesia. In the case I have quoted from Allingham, the spasmodic element is said to have disappeared under chloroform. I have never been able to satisfy myself in regard to

¹ Gaz. des Hôpitaux, 1861, No. 62.

² Nouveau Dict., Art. Muscle.

this phenomenon, and I am still uncertain how far the contractility of involuntary muscular fibre can be abolished by full anaesthesia. If Allingham's case is an example of the rule, then the question is answered for the rectum within reach of the finger, and it is safe to assume that spasm must occur here, if anywhere else in the intestinal canal; beyond the reach of the finger, we must still rely mainly upon subjective evidence, and this is certainly against the probability of persistent pure spasm.

The most recent histological study of organic stricture of the rectum¹ teaches us that hypertrophied muscular fibre is commonly present as one of the elements of thickening of the intestinal walls. This is satisfactorily explained by the increased efforts of the *detrusor* apparatus to overcome the increasing obstruction. It is a "hypertrophy of necessity," and not, as has been asserted, a result of spasm.

The cases I have now to relate presented symptoms of stricture from obstruction to the gut by pressure upon it from without. As the cause of obstruction subsequently disappeared, as well as the symptoms which had been produced by it, they may, in a certain sense, be brought into the category of phantom strictures. I have been able to find no distinctly described examples of rectal obstruction of this nature, although I am persuaded that the experience of gynaecologists must furnish similar cases.

CASE V.—Mrs. ——, an intelligent, well-nourished, and healthy looking lady, of 48, was brought to the city by her husband, with a letter from a highly respectable physician, asking advice for stricture of the rectum, of which she was supposed to have two—one at five inches from the anus, and a second, two inches farther up—for which bougies had been employed, "with much relief," for several years. The patient herself complained of habitual constipation, and "a sense of obstruction" in the lower passage, and she believed firmly that these symptoms were due to stricture. Latterly she had employed Hunyadi Janos water, but found its action harsh and unsatisfactory, and was anxious to submit to more active measures for permanent relief. As I could discover no stricture by the finger, I subjected the patient to a most thorough exploration under ether. Placing her in Sims's position, with the hips elevated, after stretching the sphincter, I was able to get a fair view of the lower two-thirds of the rectum, which was healthy and normal; and then the largest sized hollow bougie of pure caoutchouc was gradually passed fourteen inches up the bowel, and its extremity having been inflated to a diameter of at least two inches, it was slowly withdrawn without encountering any impediment whatever. It was again introduced to the extent of nine inches, and withdrawn, with the same result. As no rational symptoms of obstruction had existed at any time, nor any great distention, and as no tumour could be found in the left iliac fossa, or elsewhere in the pelvis or abdomen, I felt justified in giving a positive opinion that the patient had no stricture, and she returned home with detailed instructions as to the best method of securing natural action of the bowels.

¹ Malassez, Bull. de la Société Anatomique.

I saw this lady some months later, whilst on a visit to the city. Although not entirely free in the bowels, she was much better, and satisfied with the prospect of farther improvement.

In this case I made out a history of pelvic cellulitis six years before, which had been provoked by a long journey by rail, whilst suffering from uterine congestion coincident with interrupted menstruation at the commencement of the menopause. She had been called to what she supposed was the death-bed of a son. At the end of the journey she was taken with pelvic pain and distress, and confined to the bed, very ill, for the succeeding three weeks, at the end of which there was a free discharge of pus from the anus. From this she dated the symptoms of obstruction, and her suspicions of stricture. The experience derived from the following case, which I had seen with Dr. Quackenbos some years before, led me to express the opinion to this lady's physician that a stricture might have existed from the outside pressure of contracting bands of pelvic connective tissue left by the cellulitis and abscess, and that these had softened down and disappeared spontaneously.

CASE VI.—A young married woman, whilst menstruating, was chilled after dancing at a ball, and for some weeks afterwards suffered severely with pelvic pains and distress, accompanied by fever. Some eight months later I saw her, at the request of Dr. Quackenbos, with entire and prolonged obstruction to the bowels, which had resisted the usual internal remedies. She had seen Prof. Alonzo Clark, and he advised recourse to surgery. The patient was a well-nourished person, but at this time very much distended, having had no stool for ten days. By determined pushing, in exploring by the finger *in recto*, I discovered what felt to me like the sharp edge of a linear valve-like constriction occluding the gut at a point just about as high as I could reach whilst my friend was pushing my elbow, and the patient was bearing down with all her force. By persevering manœuvres, first a catheter, and then a rectum-tube was got beyond this valvular impediment, and then, by injections of warm water, some passage of diluted fecal matter was secured, and, little by little, entire relief. The patient was taught, after a time, to relieve herself in this way, and succeeded, as I was informed, quite well.

During the following year, whilst visiting another patient with Dr. Q., I inquired after this lady, and received an entirely favourable report, with an invitation to see her and examine her, which I did. She reported herself well, and had the appearance of perfect health, and was still using the injections, but irregularly, as the necessity for them had ceased. On exploration I was entirely unable to discover any traces of the sharp-edged projection which had obstructed the bowel so completely, and, from her report of easy and natural stools, I was forced to the conclusion that, as we had suspected, the obstruction had been caused by a contracted band of neoplasm organized outside of the gut at the time of the pelvic inflammation, and that this band had gradually developed the yielding quality of normal connective tissue.

CASE VII.—Broca¹ describes the case of a woman of 50, who had a stricture of the rectum at about four inches from the anus, produced by what was to him

¹ Bull. Soc. Anat., Paris, 1852, p. 49.

a novel cause. The uterus, which was large and knobbed, probably from fibromata, had contracted adhesions, posteriorly, with the rectum, and there were two narrow bands of plastic exudation, extending backwards, one on either side, so as to encircle and constrict the rectum. He adds the surmise that most valvular strictures are the result of a similar mechanism.

The following case is not one of stricture, but it illustrates an occasional cause of rectal obstruction in women, which, by eluding detection, might be mistaken for stricture.

CASE VIII.—A young lady of 25, or thereabouts, was brought to me from the country by her mother, with the complaint that she could not relieve her bowels whilst sitting in the usual position, and had been gradually compelled to resort to the use of a bedpan, and could only secure a passage whilst lying upon her back after taking an enema. I could find nothing wrong on exploring the rectum as she lay upon the side, but, induced by her strong conviction of the presence of an obstacle to examine the bowel with the finger whilst she was in the squatting position, I recognized that a globular tumour, which I took for the fundus of the uterus, was, in this position, forced firmly backwards into the hollow of the sacrum so as to completely obstruct the passage through the rectum. This tumour proved, on further examination, to be a fibroma, estimated to be about the size of a billiard ball, which had developed in the posterior wall of the uterus.

The last case which I shall relate, and I offer it as a contribution to the obscure subject of rectal syphilis, would seem to demonstrate that the new growths developed in tertiary syphilis may cause stricture of the rectum; and, also, that stricture arising from this cause may disappear entirely under anti-syphilitic treatment.

CASE IX.—Mr. D. B. B., 38, married, a cachectic person with a dark complexion, born near the tropics, came to the city in February, 1878, seeking relief for a chronic looseness of the bowels, with inability to retain his stools, and a painful condition of the lower bowel and anus.

Mr. B. had contracted syphilis at 25, and had taken mercury largely, but irregularly. He was overtaken by diarrhoea in China, at 31, and shortly after this, nodes appeared upon the shins. The diarrhoea became chronic, and interfered with the further use of anti-syphilitic remedies. At 35, at the Hot Springs of Arkansas, he was very thoroughly treated by inunction, after which he improved greatly, but rectal symptoms still persisted: he had frequent loose stools with occasional incontinence, and with tenesmus, passing, usually, both blood and mucus. He was examined, subsequently, in San Francisco, and said to have "piles," some of which were cut off, but it was ultimately decided that he had stricture of the rectum. At 37 he was subjected to treatment in Washington, D. C.: some "external tumours" were cut off; a "stricture" was cut, a "pouch" slit up, and a "fissure" divided—with some relief. When examined in February, 1878, the year following, in New York, we found unmistakable evidence of gummatous infiltration of the tissues at the lower end of the rectum, including the sphincters, in short, the forms of disease so fully described by Fournier under the name of *syphilome ano-rectale*. The note of the case taken at this time, says: "The circumference of the anus especially on the right side, is thickened, has a peculiar, inelastic, softish-hard feel, and is covered by a shining, livid, integument; the infiltration ex-

tends towards the right buttock. On the left side of the anus are two similar, flattened, livid surfaces, of the same consistence, but more circumscribed. From each of these surfaces lumps have been cut away, and the wounds have healed; but they are now growing again. The finger inserted into the gut encounters a hardened, infiltrated condition of its walls, velvety in feel on the mucous surface, which, at points, is eroded and thickened, but not ulcerated. There is no contractile force in the infiltrated sphincter, and this explains the incontinence of feces from which the patient has suffered. The diseased condition extends about two inches upwards into the gut. The finger when withdrawn is covered with blood and mucus. At the verge, posteriorly, is an ulcerated gap, which remains since the incision of the "fissure." As anti-syphilitic remedies had always irritated his bowels, the patient was given the modified Zittman's decoction, in mild doses, guarded by bismuth; the treatment being fortified by frictions to the skin with the oleate of mercury.

On the 2d of May, when he next visited the city, a decided improvement is noted, both in the patient's general and local condition; but I discover a distinct contraction, which admits the second joint of my index finger with slight effort, situated at the level of the upper border of the external sphincter. Calomel fumigations were added to the treatment.

Mr. B. did not again return to the city until the 3d of September following. On the same night, before I had seen him, he was seized with a sudden sharp abdominal pain, attended by retching of bloody mucus. The pain, which was excessive, was controlled by morphia, but symptoms of peritonitis, followed promptly by collapse, terminated in death in twenty hours after the first seizure. As there had been repeated vomiting of blood, and yellow fever was prevalent in the south at the time, the patient's sudden death at a hotel made it proper for the health officer to institute a formal inspection of the body, and this was done, very thoroughly, under the auspices of Prof. Janeway, aided by Prof. L. A. Stimson. A perforating ulcer was found in the upper part of the ileum. Three flat, smooth cicatrices were discovered in the neighbourhood, and, also, two points of stricture of the ileum, the narrower of which would just admit the tip of the little finger. The appearance of the parts at the anus indicated great improvement since the earlier recorded examinations. There was but little remaining evidence of infiltration of the sphincter or bowel walls, no remains whatever of stricture, and but slight traces of former disease were recognized on the most careful inspection by these gentlemen at the time, and by Dr. Keyes and myself subsequently, of the parts as preserved. Dr. Keyes, who aided me in this case, was told by the sister of the patient that he had been several months during the summer under the care of a physician, in Philadelphia, for his persistent abdominal pains and bloody stools, and that he determined to come on again to this city in consequence of a sudden and decided increase in their severity.

I think that a careful review of the history of this case, with its culmination, after the exacerbation last mentioned, in fatal perforation, and the appearances presented after death, justify the opinion that it was one of inveterate syphilis expending its violence mainly upon the intestinal canal. The cases recorded by Leichtenstern, Klebs, and others,¹ have made it next to certain that syphilis is competent to produce ulceration of the small

¹ v. Ziemssen's Cyc., vol. vii. ut supra.

intestine; and cicatrized ulceration is, perhaps, the commonest cause of stricture. In this locality stricture from any cause is asserted by Dr. Hilton Fagge, in his excellent study of intestinal obstructions,¹ to be very rare; and if we admit the syphilitic character of the ulceration in this case, it will be, as far as I can learn, unique. It is noticeable that, even if the progress of the diathetic disease had been ultimately controlled by treatment, the tightness of the stricture of the ileum might at any time have caused fatal obstruction by lodgment of ingesta.

Again, there is evidence recently placed on record by Fournier, Trélat, and Malassez, that tertiary syphilitic infiltration about the rectum and anus may give rise to stricture in this locality. The present case tends to confirm this evidence, and to establish the fact of stricture from true syphilis. Finally, in the absence of ulceration, to which, strangely enough, this form of syphilitic infiltration does not, at least in the rectum, seem to be prone, and in the absence, consequently, of the contractile element of cicatrization, stricture from true syphilitic infiltration would seem, if this case has been correctly observed, to be curable by well-directed anti-syphilitic treatment.

ARTICLE II.

SARCOMA OF THE LONG BONES ; BASED UPON A STUDY OF ONE HUNDRED AND SIXTY-FIVE CASES. By SAMUEL W. GROSS, A.M., M.D., Mütter Lecturer on Surgical Pathology in the College of Physicians of Philadelphia, and Surgeon to the Jefferson Medical College Hospital, and to the Philadelphia Hospital.

IN the number of this Journal for July, 1879, I considered the more important points in the general pathology and diagnosis of sarcoma of the long bones and completed the study of giant-celled or myeloid tumours. In the present paper I shall describe the remaining central growths along with those of periosteal origin, and compare them with the view of establishing their differential diagnosis.

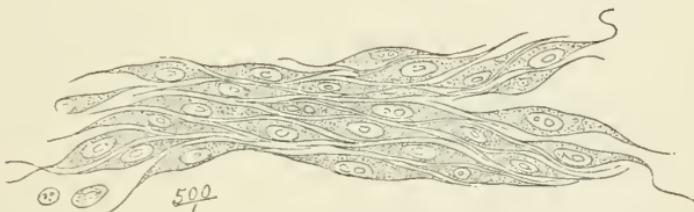
2. CENTRAL SPINDLE-CELLED SARCOMA.

Spindle-celled sarcomas, which are synonymous with the fibroplastic tumours of Lebert, the plasmomas of Follin, the fasciculated sarcomas of Cornil and Ravier, the recurrent fibroid tumours of Paget, the fibronucleated tumours of Bennett, the albuminous sarcomas of Gluge, the fasciculated carcinomas of Müller, and, in their soft forms, with the medullary or encephaloid cancers of many authors, are next to the giant-celled tumours the most common of the myelogenic sarcomas of the long bones.

¹ Guy's Hospital Reports, vol. xiv. 1869.

The elements of which they are composed, and which have their analogues in the corpuscles of developing and newly-formed connective tissue, vary greatly in their morphology in accordance with the different stages of their development. In the fibronucleated growths they look as if they were merely naked nuclei of an elongated oval form. In the recurrent fibroid or fibroplastic tumours, they are oat- or awn-shaped, or made up of slender, delicate, elongated, nucleated spindle cells. In the typical spindle-celled sarcoma, as is shown in Fig. 1, which I drew from a section of a tumour of the head of the tibia, the cells are thick, and full, and plump, and provided with one or more large nuclei, while their bodies are drawn out at each end into a filamentous process, which is sometimes divided, and renders the cell so large that it may extend over one or two fields of the microscope. From these differences in size a distinction is made between the small spindle-celled and the large spindle-celled tumours. The dimensions of the elements, indeed, appear to exert a most decided influence upon the consistence and prognosis of the growth, since it is precisely the small-celled sarcomas that are more liable to be medullary and the more disposed to recur after extirpation and occasion metastatic deposits in the internal organs.

Fig. 1.



The cellular constituents are separated, and at the same time united, by a more or less abundant hyaline, slightly granular, or, as when the growth shows evidences of a higher degree of development, as happens in the fibrous sarcomas, fibrillated intercellular substance, and they interdigitate, that is to say, the extremity of one cell is received between two contiguous cells, so that a tissue results, which is made of bands or fasciculi of closely aggregated cells. These bands pursue a parallel course, interlace in every part of the tumour, or radiate from its centre towards the periphery so that, on section, groups of what seem to be small round cells, but which are in reality transverse cuts of fusiform elements, are seen to be surrounded by longitudinal bands of spindle-celled tissue.

Spindle-celled sarcomas are met with as smooth, or slightly nodulated, but rarely bosselated, spherical or ovoid tumours, which are limited by a capsule which is indifferently periosteal, or bony, or partly membranous and partly osseous. Their cut surfaces are generally smooth, glistening, and succulent, and of a white or grayish-white tint, even when the growth is soft and fluctuating. In many specimens the prevailing colour is rosa-

ceous. In others, the white or rosy surface is marked by yellow areas, which are denotive of fatty changes, or by dark red or brown spots, which indicate points of increased vascularity or minute extravasations of blood. Their consistence is, for the most part, firm and elastic, rarely soft, and now and then positively dense and hard; and they tear apart with a fibrous grain.

Retrograde changes and accidents are not common. In one case small softening cysts were interspersed throughout the mass; in three extravasation-cysts were present; in one the large spindle-celled tissue was separated by islets of cartilage in all degrees of development; while, in three examples, calcification, or ossification, was progressing. It is interesting to note, in connection with what I have previously stated in regard to the malignity of osteoid myeloid sarcomas, that one of these cases succumbed from local recurrence and metastatic deposits.

The vascularity of these tumours is not pronounced. In the case of Demarquay, recorded by Lebert,¹ the firm, elastic growth, which was as large as a turkey's egg, pulsated and was the seat of a blowing sound, and yet the gross appearance of the tissue bore no evidences of the inordinate development of vessels, the cut surfaces varying in colour between pale yellow and yellowish-rose. In an instance reported by Richet,² there were also pulsation and a bruit de souffle. That the bloodvessels are, however, occasionally much enlarged, and the seat of sarcomatous degeneration, if not actually the starting points of the disease, is shown by the case of Mr. Adams,³ and by the following abstract of an example of hemorrhagic chondroid spindle-celled sarcoma of the lower end of the femur, recorded by M. Urdy.⁴

CASE I.—A farmer, aged 32 years, experienced, in May, 1869, lancinating pains in the region of the knee, and, six months subsequently, perceived a small tumour on each side of the articulation. At first they grew slowly; but at the end of nearly three years, when they had united on a level with the inferior third of the femur, their volume was so large as to require the man to leave work and go about on crutches. On admission into the Hôpital de la Pitié, Feb. 13, 1872, the tumour, which was ovoid, with its large extremity below, was found to extend from four inches below Poupart's ligament to the upper part of the leg. Its largest circumference was 0.85 m. or about thirty-three inches; its consistence was soft and fluctuating, especially below and externally, or at a point which corresponded to the blood cyst, and it was the seat of a dull pain which was increased by pressure; the lymphatic glands were normal; the motions of the knee were abolished; and progression without crutches was impossible. The skin was stretched, and the subcutaneous veins were voluminous.

On the 2d of March, M. Labbé amputated the thigh about an inch and a half below the great trochanter, and death ensued from purulent infection on the eleventh day. All the muscles were inserted into the periosteal capsule of the tumour, which was irregular, bosselated, of a dull white colour, hard at some points, and soft and fluctuating at others. At the outer part was a cyst, which

¹ *Traité d'Anat. Path.*, vol. ii. p. 591, and *Atlas*, plate clxx. fig. 8.

² *Bull. de la Soc. de Chir.*, vol. v. ser. 2, p. 21.

³ *Trans. Path. Soc. London*, vol. v. p. 254.

⁴ *Bull. Soc. Anat. de Paris*, ser. 2, vol. xvii. pp. 132 and 180.

contained six pints of a brown chocolate-coloured fluid mixed with fibrinous clots. Its inner surface was irregular, bossulated, and lined with decolorized coagula. The femur was fractured just below the trochanter, and a button of the morbid tissue projected into the medullary canal. The tumour was a large spindle-celled sarcoma, intermixed with islets of cartilage. The articular cartilage of the femur had undergone sarcomatous degeneration, but was not perforated.

Spontaneous inflammation, ulceration, and fungous protrusion had not occurred in any of the cases that I have collated. In one, recorded by Birkett,¹ incision into the tumour was followed by the formation of a large, fungous, bleeding, and sloughing growth. Insult of this nature is not, however, necessarily attended with so untoward an event, since in the case of Bickersteth,² a free incision closed promptly and permanently. Indeed the healing process does not appear to be retarded by the presence of spindle-celled tissue, as, in the case of Birkett, the tibia, which was broken at the site of the tumour, was completely consolidated in six weeks.

Central spindle-celled tumours are far more common in the shafts of the long bones than are myeloid sarcomas, that locality having been occupied once in every three and three-fourth cases by the former, and only once in every seventeen and one-half cases by the latter.

Their seat in 16 examples was in the

Tibia, upper epiphysis,	in 2 cases,	shaft,	in 2 cases.
Femur, lower	"	" 5 "	" " 1 "
Fibula,	"	" 1 "	
Ulna, upper	"	" 1 "	
Humerus, upper	"	" 2 "	shaft in 1 case.
			Humerus, seat unknown " 1 "

Eleven cases occurred in males and five in females, and four were traceable to traumatism.

The age at which they were first noticed was, respectively, 10, 19, 20, 21, 24, 29, 31, 32, 34, 38, 41, 41, 51, 56, 61, and 68 years, the average being 36 years. Hence they are not so frequent before the thirtieth year by 29 per cent as are the giant-celled sarcomas.

The growth of spindle-celled tumours is, on the whole, not so rapid as that of myeloid sarcomas, although in some cases they increase very quickly, and attain, for example, a circumference of nineteen inches in one year,³ or of thirty-three inches in thirty-four months.⁴ These were instances of hemorrhagic sarcoma. As an illustration of slow growth, the case recorded by Dr. Green⁵ may be mentioned, in which the tumour acquired the size of an orange in two years, and was composed of moderately firm pure spindle-celled tissue. The rate of increase and volume appear, therefore, to depend upon the consistence and integrity of the tissue; the

¹ Guy's Hosp. Reports, ser. 3, vol. x. p. 159.

² Trans. Path. Soc., London, vol. xvi. p. 227.

³ Horteloup, Bull. et Mém. de la Soc. de Chir. de Paris, vol. ii. p. 676.

⁴ Urdy, ante. ⁵ Trans. Path. Soc., London, vol. xx. p. 277.

firmer variety being marked by chronicity and moderate dimensions, while the soft, medullary, or encephaloid variety increases quite rapidly, and is far more bulky, particularly if it be the seat of extravasations of blood.

Spindle-celled sarcomas evince little disposition to break through their investing capsules. Hence the associated and surrounding tissues are rarely the seat of local infection, while metastatic deposits, as will be shown presently, occurred in only three instances. The medulla of the shaft above the seat of the tumour was invaded in one case,¹ while in one example² the cells of the articular cartilage were undergoing sarcomatous proliferation, but the joint itself was intact. In the instance recorded by Volkmann,³ the cartilage of the head of the humerus had undergone sarcomatous degeneration, and was the seat of sieve-like perforations. In the case of Horteloup,⁴ the enormous tumour of the olecranon process had projected masses into the elbow-joint, and dislocated the head of the radius forwards; and in the case of Grohe,⁵ the joint was invaded. In not a single instance were the associated lymphatic glands involved, either as the result of irritation or invasion by the disease. Hence the contrast in this respect between spindle-celled and giant-celled sarcomas is most striking.

The malignity of spindle-celled sarcoma is demonstrated by the following cases, which represent 23.07 per cent. of the whole number:—

CASE II.⁶—A girl, aged 10 years, underwent amputation at the shoulder-joint on account of a medullary sarcoma of the humerus, which was made up of fibro-nucleated tissue, and contained thin plates of bone. “The wound healed readily; but three months afterwards the disease returned in the cicatrix, which presented a tumour the size of a pigeon’s egg. Thirteen days after, a soft bulky tumour appeared in the occiput, which increased until her death, two months afterwards. On dissection, medullary tumours were found surrounding the glenoid cavity, attached to the occipital bone externally, and causing caries of it, and also between that bone and the dura mater.”

CASE III.⁷—A woman, aged 51 years, had suffered for eleven years from intermittent pains, which were aggravated by cold, at the outer part of the ankle. In April, 1867, she first noticed a swelling about three inches above the lower extremity of the fibula, which afterwards enlarged rapidly, and was attended with much pain. On the 25th of November, 1867, the lower four inches of the fibula were found to be involved by a smooth tumour, which was principally solid and elastic, but fluctuated at one point, and was tender on handling. The skin was tightly stretched and adherent over the mass; and at the most prominent point the cuticle was peeling, and the cutaneous capillaries were enlarged and tortuous.

The leg was amputated on December 3, or eight months after the growth was first noticed; but death ensued from pyaemia on the twelfth day. Two patches of “medullary cancer” were found in the upper lobe of one of the lungs; but as the primary growth “microscopically and to the naked eye displayed all the features of fibroplastic tumours,” there can be no doubt that the secondary deposits were of the same nature.

CASE IV.⁸—A tailor, aged 36 years, consulted Professor Grohe on account of

¹ Urdy, ante.

² Urdy, ante.

³ Langenbeek’s Archiv., vol. xv. p. 563.

⁴ Ante.

⁵ Bardleben, Lehrb. der Chir. und Operationslehre, 6th ed., vol. i, pp. 566 and 576.

⁶ Bennett, On Cancerous and Caneroid Growths, p. 108. Edinburgh, 1849.

⁷ Bryant, Trans. Path. Soc., London, vol. xix. p. 317.

⁸ Grohe, ante.

a tumour of the lower end of the femur, of five years' duration. It was thought to be a malignant formation, although the skin and the inguinal glands were normal. Amputation was out of the question in consequence of lung complications, from which death ensued shortly afterwards. On section, the condyles of the femur were found to be replaced by a soft small spindle-celled sarcoma, which had extended into the knee-joint and the ham. Both lungs were the seat of metastatic growths, as large as the fist, and the bronchial glands were converted into a sarcomatous mass as large as a hen's egg.

Of the sixteen cases here analyzed, one¹ died of pneumonia without operation, the tumour, which was of two years' standing, and only four inches in circumference, having occurred in a man sixty-eight years of age. In the case of Grohe, death ensued in five years from general infection, without surgical aid. Of the remaining fourteen, thirteen underwent amputation, and one excision. In three of these there is no further history.² Of the other eleven, six died from the effects of the operation,³ and in one there were metastatic deposits; one remained well for seven years, which was the date of the last report;⁴ one was alive at the end of seven months;⁵ one was doing well at the expiration of five months and a half;⁶ one recovered from the operation, but died in five months from local and general infection;⁷ and one was alive two weeks after amputation.⁸

The total duration of life from the first appearance of the disease until its termination after surgical interference, varied from five months to eight years, the average having been 37.2 months, which is three months less than the mean duration of life in giant-celled sarcoma. None of the cases, however, came under treatment as early as did the cases of the latter variety of tumour.

Central spindle-celled sarcomas usually declare themselves by spontaneous pain, that symptom having been the earliest manifestation of the affection in 60 per cent. of all instances. Attention was first directed to them by a tumour alone in 30 per cent. of the cases, and by simultaneous pain and tumefaction in 10 per cent. Pain appears to be uniformly present at some period. In its nature it is usually continuous and severe, and of a rheumatoid or gnawing nature; it is occasionally worse at night, and is aggravated by exercise and handling.

The skin is variously altered in 40 per cent. of all cases, being of a violaceous or purplish tint, tense and thinned, and adherent in about equal proportions.

The subcutaneous veins are enlarged in one half of all cases. Lymphatic involvement is never observed.

Spontaneous fracture, or fracture from very trifling causes, of the affected

¹ Coyne, *Bull. de la Soc. Anat.*, vol. xiv. ser. 2, p. 106.

² Cases of Horteloup, Demarquay, and Adams.

³ Cases of Urdy, Green, Bryant, Birkett, Kelly (*Trans. Path. Soc.*, London, vol. xx. p. 266), and Volkmann.

⁴ Birkett, *Guy's Hosp. Reports*, ser. 3, vol. x. p. 168.

⁵ Reference mislaid.

⁶ Case of Bickersteth.

⁷ Case of Bennett.

⁸ Case of Richet.

bone is met with in 44 per cent. of all cases, and is a symptom of value when considered in connection with other phenomena. Thus, if after the patient has experienced pain at a localized point for some months, the bone breaks, and a swelling develops more or less rapidly, the probabilities are greatly in favour of a sarcomatous tumour; but the particular variety of tumour will have to be determined by other symptoms, since this course of events occurs in the round-celled, as well as in the spindle-celled sarcomas.

The tumour itself has a globular or ovoid outline; its surface is generally even; its consistence is, for the most part, firm and elastic, with, possibly, one or more points of fluctuation. When its limiting capsule is bony, as happens in one-third of the cases, it may be densely hard; or, in the event of the cyst being very thin, or partly membranous, parchment-like crepitation may be elicited. On exploratory puncture, the trocar will be found to be fixed, or not move freely, and only a little blood will escape by the canula. In the hemorrhagic form of the disease, however, these signs will be reversed. Pulsation and other signs of aneurism are met with in only $12\frac{1}{2}$ per cent. of all cases.

From these considerations it follows that a moderately large, painful, rather rapidly growing, fixed, globular, firm-elastic, smooth, non-pulsatile tumour, seated in the shaft or epiphysis of a long bone, which is probably fractured, at about the thirty-sixth year, associated, possibly, with discolouration of the skin, and with enlargement of the subcutaneous veins, but with absence of lymphatic involvement and deterioration of the general health, may be pronounced to be a central spindle-celled sarcoma.

The treatment of this class of tumours should be conducted upon the same general principles as those which govern the management of myeloid sarcomas.

3. CENTRAL ROUND-CELLED SARCOMA.

Of all the neoplasms of the bones, there is none about which so much confusion exists as those termed round-celled sarcomas by Virchow, embryopathic tumours by Lebert, medulla-celled tumours by Robin and Nélaton, granulation sarcomas by Billroth, and encephaloid sarcomas by Cornil and Ranzier. Foerster included them among the juiceless carcinomas, and they were formerly regarded as encephaloid cancers. Even at the present day, they are described under the head of medullary cancer by Paget, Holmes, and others, the prefix medullary indicating that they possess the consistence and colour of the white substance of the brain.

The structure of this variety of sarcoma is usually very simple, consisting, as it does, mainly of spherical fragile cells, provided with a round or oval nucleus, and of the dimensions of the lymph or colourless blood-corpuscles, and contained in a homogeneous, dimly granular, or finely fibrillated matrix. In a word, round-celled sarcomatous tissue is made up of delicate capillary vessels, which are, however, less abundant than in

ordinary granulations, the spaces between which are filled by small, round, lymphoid cells, held together by a scanty, soft, amorphous intercellular substance. Hence their likeness to granulation tissue and to the medulla of embryonic bones, on which account the terms granulation sarcoma and medulla-celled tumour have been applied to them.

From these general features there are some histological variations. Thus in a tumour of the head of the tibia, I found that the intercellular substance formed a delicate reticulum of pale, transparent fibres, the meshes of which were occupied by a single round or ovoid cell, of an average diameter of $\frac{1}{23} \text{ to } \frac{1}{20}$ of an inch, and containing a nucleus, the mean diameter of which was about two-thirds of that of the cell. When entirely freed from the corpuscular elements, the hyaline fibres, at many spots, appeared to proceed from a common centre, or nodal point, as is delineated at *a*, Fig. 2, which I drew from a partially pencilled-out section. The entire structure, therefore, was very similar to the cytogenous or adenoid tissue of the lymphatic follicles. This variety of round-celled sarcoma corresponds to the glions sarcoma of Virchow,¹ and is described by Rindfleisch² as lymphatic gland-like, or lymphadenoid round-celled sarcoma.

A still greater departure from the ordinary type of tissue, and it was met with in four of the cases which I have collected, is observed in the tumours originally classed by Billroth³ as alveolar sarcoma, an illustration of the minute appearances of which is afforded by Fig. 3, copied from that

Fig. 2.

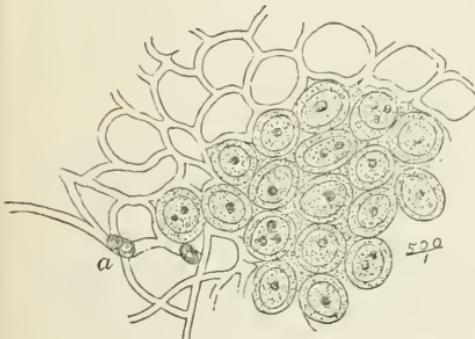
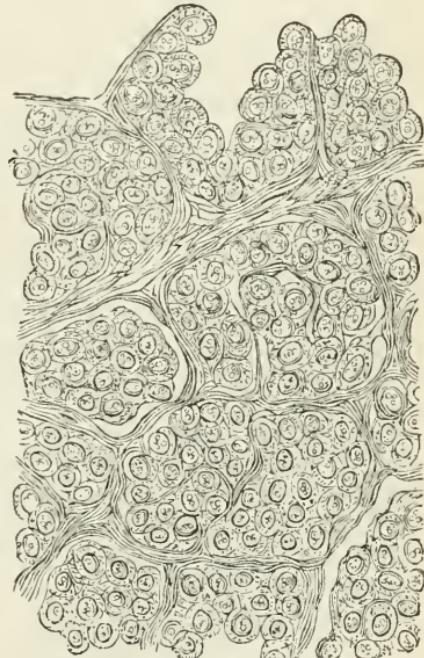


Fig. 3.

¹ Op. cit. p. 208.² Langenbeck's Archiv, vol. xi. p. 224.³ Op. cit. 134.

observer. Roundish heaps of small cells, which look not unlike giant cells, are seen to be contained in the alveoli or spaces of a connective-tissue meshwork. At certain points the masses of cells are intersected by delicate bands of connective tissue, which are given off by the coarser trabeculae, and which divide the larger clusters into smaller ones. The formation of these fine fibrils is ascribed by Billroth to the condensation of the outer layer of the protoplasm of the cells, in which view he is upheld by Neumann.¹ Tumours which possess this structure are excessively vascular. In the case from which the illustration was taken,² it occupied the shaft of the tibia of a man, aged 29 years, was of two years' duration, and was characterized by marked pulsation, and a bellows sound. The telangiectatic tissue was found, after amputation, to be the seat of numerous extravasations of blood. The enormous production of new vessels has, therefore, led Dr. Jaffé³ to regard alveolar round-celled sarcomas as being nothing more than plexiform angiosarcomas, the alveolation being due to the course pursued by the numerous vessels. He, moreover, traces the production of the sarcomatous elements to the proliferation of the nuclei of the vessels, and quotes numerous authorities who recognize this mode of genesis of sarcomatous tumours in various parts of the body. His deductions are based upon the study of a pulsating periosteal alveolar sarcoma of the iliac bone; and it is a striking fact that nearly all of the recorded growths of this nature, whether central or peripheral, were the seat of pulsation, and were often confounded with aneurism.

It will thus be perceived that the formation of an alveolar stroma in certain sarcomas of the bones is referred by Billroth to changes which take place in the cells, while Jaffé refers it to the course pursued by the bloodvessels of the neoplasm. That the latter do play an important part in the production of an alveolar structure there can be no doubt, and I am myself disposed to agree with Jaffé that the walls of the alveoli in the very vascular sarcomas are formed by the capillaries, and, with Weber,⁴ that in the less vascular tumours the stroma is due to the obliteration of these channels and their conversion into solid fibres.

I have myself quite recently had the opportunity of studying this variety of morbid growth, for the specimen and the history of which I am indebted to Dr. T. H. Burchard, of New York.

CASE V.—A married woman, in excellent general health, and 24 years of age, came to the New York Dispensary, Oct. 18, 1875, on account of a very painful tumour of the right knee, which measured thirteen inches more in its greatest circumference than its fellow. There was no discoloration of the skin; a few large veins crossed the growth; and the inguinal glands were not involved.

¹ Prager Vierteljahrsschrift, vol. ii. 1871, p. 6.

² Billroth, Chirurgische Klinik., Zurich, 1860-67, p. 568.

³ Langenbeck's Archiv, vol. xvii. p. 102.

⁴ Virchow's Archiv, vol. xxviii. p. 237.

Two years previously, without assignable cause, she was seized with intense pain in the knee, which soon began to swell. It was then treated as synovitis, and a plaster-of-Paris splint, which was applied, intensified her suffering to such a degree that it had to be removed. In September, 1874, or eleven months after the trouble was first noticed, Professor Post tied the femoral artery, under the supposition that he was dealing with an aneurism of the lower end of the femur. The operation materially relieved the pain for some months. In April, 1875, the tumor was diagnosed to be cancerous, but she declined surgical interference. When seen by Dr. Burchard, it was pronounced to be an osteosarcoma, and amputation was advised.

After this date, the woman was lost sight of, until January 24, 1876, when she was found to be excessively emaciated, suffering greatly from dyspnoea, and in a dying condition. The total duration of the disease was two years and three months. A complete autopsy was not permitted.

On laying open the osteo-periosteal capsule, I found that the growth originated in the lower epiphysis of the femur, which was separated from the shaft by a dentated fracture. It was a medullary tumour, and the seat of large extravasation-cysts, and extensive calcareous deposits. The investing cartilages of the joint were sound.

Minute examinations, which were conducted with Dr. Shakespeare, of thin sections taken from the firmer, fibrous-looking, peripheral portions of the neoplasm, disclosed a connective tissue stroma, the trabeculae of which inclosed round, oval, and fusiform alveoli, which averaged $\frac{3}{5} \text{ mm}$ in length and $\frac{1}{10} \text{ mm}$ in breadth, and were filled with lymphoid cells, containing large nuclei. Although the vessels were not injected, they were seen to have undergone sarcomatous changes.

It will thus be seen that the likeness of alveolar round-celled sarcoma to encephaloid or soft carcinoma is so great that a mistake is liable to occur to an inexperienced observer. Indeed, these tumours are regarded by Rindfleisch¹ as sarcomas undergoing carcinomatous degeneration, on which account he terms them carcinomatous sarcomas. The points of distinction, however, are, first, that the cells are intimately connected with the walls of the alveoli or the vessels which form the alveoli; secondly, that, by pencilling, an intercellular substance, like that met with in the lymphadenoid form of tumour, is disclosed, the fibres of which arise from the coarser trabeculae which separate the tissue into groups of cells, and, thirdly, that the cells are pretty uniform in shape and size, being round and oval, and of about the dimensions of a white blood corpuscle. In carcinoma, the cells are of an epithelial type, loosely heaped in the loculi, without the intervention of intercellular substance, and polymorphous, and vary greatly in size. In other words, in alveolar sarcoma the stroma and cells are intimately interwoven into a single tissue, whereas in carcinoma, the cells and stroma are easily separable into two distinct tissues.²

Like the other forms of central sarcoma, round-celled tumours are generally globular or ovoid, and of a smooth, even outline. When, however, they are very soft, or are the seat of extravasations of blood, or when they

¹ Op. cit. p. 136.

² *Vide Waldeyer, Virchow's Archiv*, Vol. Iv. p. 151.

have burst through their capsules, they are bosselated, and in this event the prognosis is bad. They are contained in an investing capsule, which is usually membranous or partly osseous, and completely bony in one-fourth of all instances. From the inner surface of the capsule bands are sometimes given off which intersect the mass and give it a lobed appearance.

On section, the cut surfaces are white, grayish-white, pinkish-yellow, or rosaceous gray, and pervaded by enlarged vessels, or marked by dark-red, or brown, or violaceous points, or dotted with minute ecchymoses. In some examples, the tissue looks precisely like a recent coagulum; in others, and this is not infrequent, the centre of the tumour is occupied by a single cyst filled with blood in various stages of transformation, or by numerous extravasation-cysts. In other specimens yellow areas denote fatty changes. Their consistence is usually soft and moderately elastic, but they are so friable that they are readily crushed by slight pressure. In some examples there is a disposition on the part of the material to tear in bundles; but, in general, their consistence, when they first come under observation, at which time they have undergone certain retrograde changes, is comparable to that of softened cerebral pulp.

The vascularity of round-celled sarcomas is varied. In the tumours which are composed of a tissue analogous to that of granulations, the blood supply is comparatively slight. In the lymphadenoid and alveolar forms, on the other hand, the tissue is pervaded by voluminous vessels, arterial, venous, and capillary. Hence it is by no means uncommon, when the arteries predominate, for these tumours to pulsate and simulate aneurism, as happened in the cases of Billroth,¹ Burchard,² Mercier,³ and Lücke.⁴ In other, or in the same, instances, extensive interstitial effusions of blood are met with, as occurred in those recorded by Bryant,⁵ Poland,⁶ Lücke,⁷ Weil,⁸ Burchard,⁹ and Butler,¹⁰ through which the neoplasm has the appearance of a recent clot, or is converted almost entirely into a large blood-cyst, the walls of which are composed of a thin layer of the original sarcomatous tissue, and, perhaps, lined by soft clots or layers of fibrine. From these accidental appearances have originated the names haematoma of bone, haematoïd cancer,¹¹ and blood-cyst. In cases of this description minute examination discloses that the cause of the hemorrhage is to be found in the state of the minute vessels and the metamorphoses which the growth has undergone. In the majority of instances, fatty, myxomatous, or hyaline degeneration has taken place, and the adventitia of the vessels is

¹ Ante.

² Ante.

³ Bull. Soc. Anat. de Paris, ser. 2, vol. ii. p. 241.

⁴ Virchow's Archiv, Vol. xxxv. p. 530.

⁵ Guy's Hosp. Rep., ser. 3, vol. xx. p. 358.

⁶ Ibid., vol. xvi. p. 469.

⁷ Ut supra.

⁸ Prager Vierteljahrsschrift, Bd. iv. 1877, p. 14.

⁹ Ante.

¹⁰ Lancet, vol. ii., 1876, p. 607.

¹¹ Paget, op. cit. p. 758.

the seat of rich cellular infiltration, through which they lose their powers of resistance, become varicose, and finally rupture.

A most striking illustration of sarcomatous blood-cyst, or of hemorrhagic sarcoma, as it is more properly denominated by Virchow, is that recorded by Dr. Weil from the practice of Professor Heine, which presents many points of interest to the pathologist and to the practical surgeon.

CASE VI.—A tailor, aged 19 years, without assignable cause, experienced continuous pain in the left shoulder, which was followed, in fourteen days, by the appearance of a round, firm, fixed, painful tumour in the vicinity of the acromio-clavicular articulation, which in eight days attained the size of a fist and became softer. On admission, or seven weeks after he first experienced pain, the shoulder was the seat of a round tumour of the volume of a child's head, which was, for the most part, soft and fluctuating. The temperature was elevated, the skin was stretched and slightly discolored at one point, and the subcutaneous veins were much enlarged. The swelling was first thought to be a periosteal abscess, but during the next few days, the progressive increase of the growth, and the spontaneous fracture of the surgical neck of the humerus, did much to clear up the diagnosis.

On exploratory incision, which gave vent to much blood, the finger passed into a cavity filled with coagula and broken-down tissue, and the soft tumour felt like a sponge protruding from the broken head of the bone. Amputation at the shoulder-joint was practised two days later, but despite the fact that the axillary artery had, as a preliminary step, been ligated in the first portion of its course, it continued to bleed, and it, as well as upwards of twenty smaller vessels, had to be secured. The infiltrated deltoid muscle, as well as a portion of the great pectoral, and the spine of the scapula required removal.

Fourteen days subsequently, local recurrence was observed to have taken place in the subelavicular region, corresponding to the stump of the great pectoral muscle. The round tumour, which also consisted of blood and broken down tissue, was excised, and the patient was discharged six weeks and a half after the arm had been removed.

On dissection, the growth was found to have originated in the head of the humerus, and to have converted all the soft tissues around the upper third of that bone into a soft hemorrhagic mass. Numerous vessels, many of which were of the size of the radial artery, opened on the inner surface of the cyst, which was partly lined by a lardaceous membrane, and partly limited by softened tissue, both of which were pervaded by thrombosed vessels. Minute examination of the peripheral portions of the tumour showed it to be a very vascular round-celled sarcoma, undergoing, in its softer portions, myxomatous degeneration. The adventitia of the vessels was infiltrated with similar cells in a state of fatty degeneration.

In the case of Mr. Butler, the inner condyle of the femur and the soft, spongy tumour contained within it had been fractured, and the walls of the blood-cyst were formed by the thickened periosteum.

Round-celled sarcomas are liable to the same degenerations as the other forms of central sarcoma. Of these the myxomatous and fatty are the most common. They not infrequently coexist, and give rise to rapidly-growing and enormous tumours, and by rendering them soft and succulent, greatly increase the probability of metastatic deposits in distant organs. Calcareous and ossific transformations are met with in about 17 per cent. of all cases, and hyaline degeneration of the bloodvessels in 9 per cent. In connection with the former, it is interesting to note that one of the two cases in which it occurred was characterized by secondary growths in the lungs.

Spontaneous inflammation of these tumours is rare. In the case of Poland,¹ the thinned and discolored skin gave away at several spots, through which offensive fungous masses protruded. Traumatism, however, is very liable to provoke inflammatory changes, as was witnessed in the case recorded by Teinturier,² in which exploratory puncture was followed by adhesion and superficial ulceration of the skin.

Round-celled sarcomas occur more frequently in the diaphyses of the long bones than do the other forms of sarcoma, the proportion being 33.33 per cent. against 27.27 per cent. for the spindle-celled, and 5.71 per cent. for the giant-celled growths. Their seat in twelve cases was in the

Femur,	upper epiphysis,	in 3 cases,	lower epiphysis,	in 2 cases,	shaft,	in 2 cases.
Tibia,	" "	1 "			"	1 "
Humerus,	" "	2 "			"	1 "

Seven cases occurred in females, and five in males. In only two was traumatism assigned as the exciting cause of the disease.

The age at which they were first noticed was, respectively, 9, 19, 19, 22, 24, 27, 28, 32, 34, 35, 40, and 46 years, the average being 28 years, which corresponds very closely with the average age at which giant-celled sarcomas are first observed, although it is eight years earlier than the mean age of occurrence of spindle-celled tumours. They are not so common before the thirtieth year, by 8 per cent., as are myeloid sarcomas, but they are more common before that age, by 20 per cent., than are the spindle-celled tumours.

Round-celled sarcomas grow more rapidly than any other neoplasm of the osseous system, attaining the volume of a child's head in seven weeks,³ or a diameter of seven inches in two months and a half,⁴ or a circumference of thirty-four inches in three years,⁵ the rate of increase being greatest in the soft, fluctuating tumours, and in the hemorrhagic forms. Their growth is continuous and not interrupted, and although it may be comparatively slow at first, it is sure to be quick before its final termination. One patient became pregnant and was delivered, at the full term, of a healthy child, during the progress of the disease, and, as the time advanced, the tumour "visibly increased in size every week." The rate of growth is also greatly influenced by traumatism, whether accidental or intentional, a blow, or exploratory puncture, for example, rendering its increase more acute.

The investing capsule is more liable to spontaneous perforation than in the other forms of central sarcoma. In the cases of Nélaton, and Billroth, the growths also surrounded the shafts of the bones, and in that of Teinturier the tumour protruded into the ham. Fracture of the capsule, through which the surrounding soft structures are liable to become involved

¹ Ante.

² Bull. Soc. Anat. de Paris, ser. 2, vol. xii. p. 491.

³ Case of Weil.

⁴ Case of Nélaton, op. cit. p. 325.

⁵ Case of Poland.

in the growth, is not uncommon, that accident having occurred in the cases recorded by Mercier, Bryant, Poland, Lücke, Weil, and Butler.

The locally infectious nature of these tumours declared itself by extensive infiltration of the medulla of the bones in which they originated, in two instances;¹ and by invasion of the surrounding muscles in four cases.² In one case³ the tumor was being prolonged into the corresponding joint, but the cartilage was intact. In those recorded by Bryant and Poland, in both of which the upper extremity of the femur was the seat of the disease, the cartilages of incrustation were undergoing sarcomatous degeneration. In the case of Mr. Bryant, the disease had extended to the floor of the acetabulum through the round ligament; while in that of Mr. Poland, the ligament was sarcomatous only at its root, but the acetabulum and the anterior inferior spine of the ilium were invaded by the morbid tissue. The extension of sarcomatous elements by the ligaments is a point of extreme interest, as it has a direct bearing upon the question of amputating through a joint or at a point higher up. The same occurrence, it will be remembered, was witnessed in Mr. Butlin's osteoid myeloid sarcoma of the upper end of the tibia, in which the disease passed up to the femur through the cruciate ligaments.

Enlargement of the neighbouring lymphatic glands was noticed in only three instances. In that of Teinturier, the inginal glands were normal, and it was only upon dissection that those of the ham were found to be "degenerated." In the case of Bryant, the structure was that of an ordinary lymphatic gland in a state of irritation. In the third case there is no report of the condition of the glands.

Infection of distant organs, or generalization, occurs more frequently in round-celled than in any other central tumour of the long bones. It was met with in 33.33 per cent., or in four of the twelve cases, which I have collected, and of which I append brief abstracts.

CASE VII.⁴—A man, aged 24 years, had suffered, for nine months, from a partly hard and partly fluctuating tumour of the head of the tibia, which had a circumference of eight inches more than the sound limb. After amputation, which proved fatal, from pyæmia, on the fourteenth day, the tumour was found to contain bony plates and spicules, ecchymotic spots, and small clots. The gastrocnemius muscles were infiltrated, and secondary deposits were found in the lungs.

CASE VIII.⁵—A man, aged 36 years, after a severe strain, eighteen months previously, came under Mr. Bryant's care, for a painful, smooth, hard tumour of the hip, which was twice as large as its fellow. On excision, the head, neck, great trochanter, and upper part of the femur were found to be the seat of an alveolar sarcoma, which had invaded the acetabulum through the medium of the round ligament. On death, on the fourth day, the pleura, liver, and kidney, were seen to contain, each, a metastatic nodule; the adductors of the thigh and

¹ Cases of Teinturier and Mercier.

² Cases of Teinturier, Bryant, Poland, and Weil.

³ Case of Teinturier.

⁴ Teinturier, ante.

⁵ Bryant, Guy's Hosp. Rep., ser. 3, vol. xx. p. 360.

the iliaceus muscle were infiltrated with small deposits, and a nodule was also detected in the internal obturator muscle.

CASE IX.¹—A woman, aged 34 years, died, without operation, under the care of Mr. Poland, with a fungating hemorrhagic sarcoma, of three years and two months' standing, which was pretty uniformly firm, hard, and inelastic, and had a circumference of thirty-four inches. The tumour, which consisted mainly of blood in various stages of transformation, occupied the upper half of the femur, and had partially invaded the round ligament, the acetabulum, and the iliac bone in the region of the anterior inferior spine. The inguinal glands were free from disease; the femoral vein contained polypoid growths of sarcomatous tissue; several soft masses projected from the surface of the lungs, but were rooted in the pulmonary tissue; and there were also several small nodules present beneath the pleura.

CASE X.—Billroth² disarticulated the arm of a girl, 9 years of age, on account of an alveolar sarcoma of the humerus. The patient had fully recovered from the operation, which was done on the 24th of June, 1865, in four weeks; but at the expiration of one month, secondary growths appeared upon the parietal bone, the occipital bone, and upon each mastoid process. At the time of death, May 20, 1866, shortly before which the sternum also became affected, the first tumour was as large as the fist, and the others were somewhat smaller. They were all at first firm, but latterly they were soft and fluctuating. There was no return in the stump, and there were no signs of lung complications. In addition to the tumours of the osseous system, a soft, dark-brown sarcoma of the size of a large apple was found in the brain. The entire duration of the disease was twenty-two months.

It will be observed that the lungs alone were the seat of metastatic deposits in two cases; that the pleura, liver, and kidneys were affected, but that the lungs escaped, in one; and that the osseous system and brain were involved in the fourth case. In no instance were the intervening lymphatic glands the seat of secondary deposits; while in one example a large vein was filled with the material of the tumour. These facts, taken in connection with those of a similar nature which occurred in the giant- and spindle-celled growths, show conclusively that constitutional contamination takes place through the bloodvessels and not through the lymphatics.

Of 12 cases of round-celled sarcoma, 3 ran their course without amputation. One of these, that of Mercier,³ died of coma, about six months after the appearance of the first symptoms; one, that of Poland,⁴ died of exhaustion and metastatic deposits at the expiration of thirty-eight months; while, in the case of Burchard,⁵ the fatal termination ensued in twenty-seven months from supposed secondary deposits in the lungs. Hence the average duration of life is 23.2 months, which is much shorter than is witnessed in the other varieties of central sarcoma, since in myeloid tumours the mean prolongation of life, when the disease pursues a natural course, is 46 months, and 42 months in spindle-celled sarcoma.

In the remaining 9 cases, 8 of which were subjected to amputation, and 1 to excision, the duration of life, from the first observation of the disease to its termination, varied from two months and a half to five years and a

¹ Guy's Hosp. Rep., ser. 3, vol. xvi. p. 469.

² Chirurgische Klinik, Zurich, 1860-67, p. 453.

³ Ante.

⁴ Ante.

⁵ Ante.

quarter, the average having been 17.6 months. Of the 9 cases, in 5¹ death was directly due to surgical measures; one² recovered from operation, but died, eleven months subsequently, from secondary growths in the brain and skull; and three remained well, respectively, six weeks,³ four months,⁴ and four and a half years⁵ after amputation.

The above facts indicate that round-celled sarcomas run a more rapid course than the other central tumours, the total duration of life after operation in the former being 17.6 months, against 40.9 months for myeloid sarcoma, and 37.2 months for spindle-celled sarcoma.

Round-celled sarcomas are ushered in by pain in 75 per cent. of all cases, and by the appearance of a tumour alone in 25 per cent., but in two-thirds of the latter suffering declares itself later. In one instance only was pain altogether absent. In the majority of cases it is continuous and severe, and increased by motion. The skin is variously altered in 41 per cent. of all cases, being merely stretched, but movable, in the great majority, and rarely discolored. The subcutaneous veins are enlarged in the same ratio, but only to a marked degree in about one-half of the cases. Spontaneous fracture occurs in 50 per cent. of all instances. In three an accident of this nature, preceded by pain in the part, and followed by the appearance of a tumour, which continued to increase, led Mercier, Bryant, and Heine, to diagnose malignant disease.

The tumour itself is usually smooth, spherical, or ovoid, and soft and moderately elastic in consistence, although it may be the seat of obscure and deep fluctuation. In rare cases its consistence is firm. On exploratory puncture, the instrument moves about freely, and blood escapes at the opening. The temperature is noted to have been elevated in one instance.⁶ In four cases, or 33.33 per cent. of all cases, pulsation was present. In two of these the disease was thought to be aneurism, and in one the femoral artery was actually ligated. It is interesting to note that in three of these instances the shaft of the long bones was the seat of the tumour.

Pulsation occurs much more frequently in round-celled than in giant-celled sarcoma, and nearly three times as often as in spindle-celled sarcoma. In giant-celled tumours, however, pulsation was observed in those cases only in which the articular extremities of the long bones were affected; while, in round-celled tumours, that sign was met with three times when the shaft was affected, and only once when the epiphysis was the seat of the disease. Hence pulsation, when taken in connection with other symptoms, is a valuable point in the differentiation of these two forms of sarcoma.

¹ Cases of Nélaton, op. cit. p. 325; Teinturier, Bryant, Butler, and Billroth (*Chir. Klinik*, p. 568).

² Billroth, ante.

³ Weil, ante.

⁴ Bryant, ante.

⁵ Lücke, ante.

⁶ For elevation of temperature in sarcomas consult a paper by Professor Estlander, *Trans. International Med. Congress of Philada.*, 1876, p. 658.

In conclusion, an immovable, bulky, rapidly growing, painful, soft, pulsating tumour, especially if seated in the shaft of a long bone, occurring at about the 28th year, and attended with fracture, and, possibly, the protrusion of a fungous mass, and enlargement of the subcutaneous veins, but without discoloration of the skin or involvement of the lymphatic glands, may be said to be a central round-celled sarcoma.

The treatment is limited to early amputation, practised as close to the trunk as may be consistent with the safety of the patient. If the tumour involves an epiphysis, the limb should not be removed through the corresponding articulation, as it is liable to be invaded by the morbid growth.

The Differential Diagnosis of Central Sarcomas.—Myelogenic sarcomas, especially when they increase rapidly, are liable to be confounded with each other. Hence, as an aid to their discrimination, I have set forth their affinities and contrasts in the following table:—

	Giant-celled.	Spindle-celled.	Round-celled.
Frequency of occurrence	71.42 p. c.	16.32 p. c.	12.24 p. c.
Appear before the 30th year	66.66 "	37.5 "	58.33 "
Seated in the shaft of the long bones	5.71 "	27.27 "	33.33 "
Ushered in by pain	50 "	60 "	75 "
" " swelling	19 "	30 "	25 "
" " " and pain	31 "	10 "	0 "
Pain throughout the disease	40 "	100 "	91 "
Skin variously altered	33 "	40 "	41 "
Subcutaneous veins enlarged	27 "	50 "	41 "
Infection of adjacent tissues	12 "	18 "	66 "
Lymphatic glands tumefied or involved	16 "	0 "	25 "
Metastatic deposits	22.72 "	23.07 "	33.33 "
Local recurrence	8 "	20 "	25 "
Pulsation	20 "	12.5 "	33.33 "
Joints invaded	14 "	25 "	25 "
Fracture, spontaneous, or from slight causes	4 "	44 "	50 "
Duration of life without operation	46 mos.	42 mos.	23 mos.
" " with "	40.9 "	37.2 "	17.6 "
" " " " and remain- } ing well }	54.8 "	64 "	24 "

An inspection of the foregoing clinical features shows that all the varieties of central sarcoma are malignant, and that the degree of malignity is, commencing with the lowest in the scale, in the order named. It is curious, however, to observe that the myeloid growths occur at an earlier age, and are marked by sympathetic lymphatic involvement nearly two-thirds as frequently as the round-celled, which are the most pernicious. It is also notable that in the spindle-celled tumours, the lymphatic glands are never enlarged, and, as this statement is almost true of the same variety as met with growing from the periosteum, it forms an important point in the diagnosis. The apparent discrepancy in the duration of life

of those surviving surgical interference between the giant and spindle-celled sarcomas, is due to the fact that in one of the latter life was prolonged for seven years, and the cases were much less numerous.

It will also be seen, and this also is an important aid in the differential diagnosis, that a central sarcoma occupying the shaft of a long bone is far more likely to be a round-celled or a spindle-celled, than a giant-celled growth. Although pulsation is more frequent by 13 per cent. in round-celled tumours than in those composed of multinucleated elements, it is remarkable that in the former the shafts of the bones were affected in three of the four cases in which that sign was noticed, whereas the epiphyses alone were involved in the latter. In the two instances of spindle-celled sarcoma the pulsating tumour was seated in the shaft in one and in the articular extremity in the other. Hence if a pulsating central sarcoma is observed in the diaphysis of a long bone, the chances are three to one that it is composed of round cells, and that in no instance is it a myeloid tumour. If, on the other hand, the epiphysis of a long bone is occupied by a pulsating growth, the chances are ten to one that it belongs to the giant-celled variety.

Of the remaining central neoplasms of the tubular bones the only one that is liable to occasion errors in diagnosis is enchondroma. When compared with the sarcomas it is of far less frequent occurrence, as it forms only 14 per cent. of all cartilaginous tumours, while 59 per cent. of all sarcomas originate in the medulla. It is less painful, of slower growth, of firmer consistence, and has a nodulated or bosselated surface, which is rarely witnessed in sarcoma unless the capsule is perforated, or the morbid material is the seat of cystic degeneration or extensive hemorrhages, when, in addition, the tumour is soft. Enchondroma, moreover, is more common in males; it never occurs so early or so late in life as the sarcomas; and it appears, on an average, four years sooner than the latter. It does not pulsate, invade the joints, nor does it fungate, although in 20 per cent. of all instances the overlying integuments ulcerate and the degenerated fluid contents escape, to the amount even of thirty-two quarts, as in an example recorded by Nélaton.¹ Enchondromas are very liable to undergo mucoid softening and cystic degeneration, those changes having occurred in 60 per cent. of all instances, in consequence of which they not only attain a huge volume,² far greater, indeed, than do the sarcomas, but are also attended by frequent enlargement of the subcutaneous veins. Finally the central chondromas do not give rise to metastatic deposits.

For convenience of reference the characteristics of these affections are given in the subjoined table.

¹ *Gazette des Hôpitaux*, No. 13, 1855, p. 50.

² In the cases of Nélaton and Crampton, for example, the thigh measured, in the first, nearly six feet, and, in the second, six feet and a quarter in circumference.

CENTRAL CHONDROMA.¹

1. Forms 14 per cent. of all cartilaginous tumours.
2. Appears between the seventeenth and fifty-ninth years, the average being the thirty-third year.
3. Eighty per cent. of all cases occur in males.
4. Grows comparatively slowly; but may acquire a huge bulk.
5. Usually begins insidiously, but pain is present throughout in 30 per cent. of all cases.
6. The subcutaneous veins are enlarged in 60 per cent. of all cases.
7. The skin is variously altered in 20 per cent. of all cases.
8. The lymphatic glands are enlarged in 10 per cent. of all cases.
9. Spontaneous fracture, or fracture from slight causes, is met with in 20 per cent. of all cases.
10. Metastatic deposits, or general dissemination of the disease, do not occur.
11. Never pulsates.
12. Does not invade the joints.

CENTRAL SARCOMA.²

1. Forms 59 per cent. of all sarcomas.
2. Appears between the ninth and sixty-eighth years, the average being the twenty-ninth year.
3. Fifty-six per cent. of all cases occur in males.
4. Increases comparatively rapidly, and never attains so large a size.
5. Generally ushered in by pain, and suffering is present throughout in 60 per cent. of all cases.
6. The veins are enlarged in only 30 per cent. of all cases.
7. The skin is altered in 37 per cent. of all cases.
8. The lymphatic glands are enlarged in 14 per cent. of all cases.
9. That accident occurs also in 20 per cent. of all cases.
10. Secondary deposits are met with in 25 per cent. of all cases.
11. Pulsation is observed in 20 per cent. of all cases.
12. The joints are involved in 18 per cent. of all cases.

As the distinction between aneurism, white swelling, and sarcoma of the bones was dwelt upon in my first paper, it need not be referred to again.

II. *Periosteal Sarcomas.*

The peripheral, periosseous, or periosteal sarcomas include those which originate in the soft osteogenic layer of the periosteum, in contradistinction to the tumours which are attached to the outer fibrous layer of that membrane, which should rather be considered as parosteal growths, or sarcomas developed in the tissues surrounding the bone and affecting the periosteum secondarily. In the true peripheral sarcomas, the tumour is seated between the bone and periosteum, the latter of which is constantly regenerating itself to form a limiting capsule for it, which persists unchanged in the firm sarcomas, but is liable to be transformed into tumour elements in the soft sarcomas, through which it may finally be destroyed,

¹ Based upon an examination of ten cases.

² Based upon an examination of seventy-eight cases.

and allow the disease to invade the adjacent tissues. The bone itself upon or around which the growth is seated may be entirely normal, or be partially absorbed, and present numerous cavities through local infection of its cortex. Now and then it is rendered so brittle that it fractures from very slight causes; in other cases, the medullary canal and the spongy substance of the epiphysis are the seat of new deposits from the extension of the disease along the Haversian system.

Periosteal sarcomas, so far as my investigations go, never form myeloid tumours, although a few giant cells may be detected at the points where the bone has been destroyed. In their histological construction, they are either made up of a spindle-celled or a round-celled tissue, which evince a remarkable tendency to calcification or ossification of their intercellular substance, which is easily explained by their point of origin. In many instances the deposition of the early salts and ossification proceed to such an extent, that, when the softer portions have been removed by maceration, a bony skeleton or framework is left, which might be mistaken for spongy exostoses or osteophytes.

Periosteal sarcomas, which have not undergone these transformations, are comparatively rare. Thus of 67 specimens or histories that I have examined, 9, or 13 per cent., were composed of more or less pure spindle-celled tissue, 13, or 19 per cent., of round-celled tissue, while not less than 45, or 67 per cent., were instances of ossifying and calcifying tumours.

In a general way, periosteal sarcomas may be distinguished from the central sarcomas, by their relative infrequency, by their occurrence earlier in life, the average age at which they appear being $22\frac{1}{2}$ years, by their marked malignity, which is greater by 43.5 per cent. than in the myelogenic tumours, by the more frequent implication of the lymphatic glands, by the excessive suffering which they awaken, and by their disposition to calcareous and ossific transformations, which is greater, by 47 per cent., than in the central growths. They are not contained in bony capsules, are not so liable to extensive effusions of blood, and they evince little tendency to invasion of the joints, to pulsation, and to fracture from slight causes. Thus, while extension into the articulations, pulsation, and fracture occur in the central sarcomas in the proportion respectively of 18 per cent., 20 per cent., and 20 per cent., these features are only met with in 7 per cent., 1.8 per cent. and 5 per cent. of the peripheral tumours.

In accordance with the plan that I have followed in the study of the central sarcomas, I shall analyze those of periosteal origin, dividing them into the round-celled and spindle-celled, and making a separate group of the osteoid tumours, as a good deal of confusion still exists as to their true nature.

1. *Round-celled Sarcoma.*

In their histological construction, degenerations and combinations, and appearances on section, periosteal round-celled sarcomas do not differ ma-

terially from those of a similar structure which arise in the medulla. Of the thirteen cases that I have examined, seven were of the ordinary granulation type, four were alveolar, and two were of the lymphadenoid variety. While they grow as rapidly, and kill as quickly as do the central sarcomas, they occur at an earlier age, are most common in males, evince greater disposition to local infection and metastatic deposits, contaminate the associated lymphatic glands, and produce changes in the skin more frequently, and elevate the local temperature in a much larger proportion of the cases. Unlike the central round-celled tumours, they very rarely occasion fracture of the affected bone, never pulsate, nor are they the seat of such extensive extravasations of blood.

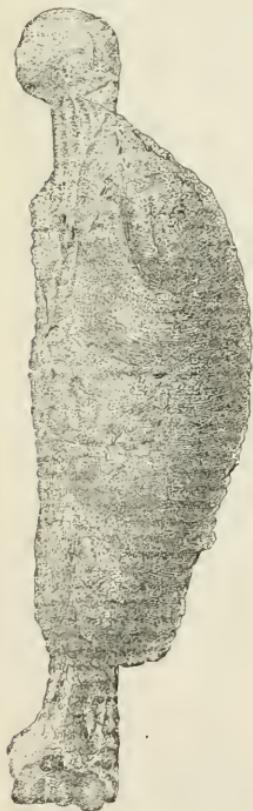
Excellent illustrations of the structure and of the great rapidity of the growth of these neoplasms are afforded by the following cases:—

CASE XI. A youth, nineteen years of age, on the 7th of July, 1872, accidentally struck his left arm above the elbow, but the injury, which was followed by slight ecchymosis, was productive of so little inconvenience that he continued his work about the farm. Five weeks and a half subsequently he first noticed a tumour, about as large as a pullet's egg, at the site of the blow. This rapidly enlarged, and, on the 9th of November of the same year, or at the expiration of four months, when he was admitted into the hospital of the Jefferson Medical College, it measured, at a point

seven inches above the inner condyle, twenty inches in circumference, or thirteen inches more than the opposite limb at a corresponding point, while its length was nine inches. Its growth was painless throughout; the entire limb was very oedematous; the temperature was elevated; the subcutaneous veins were immensely enlarged; the skin was discolored and adherent; and its consistence was soft and apparently fluctuating. One morning, about six weeks before admission, he noticed that the humerus had given way during the previous night. There was no glandular involvement; the patient had a good appetite, and slept well, but the pulse was irritable and weak; the face was sallow and anaemic, and he was much emaciated. The mass had been punctured one week previously under the supposition that it was an abscess, but blood only followed the withdrawal of the knife. Amputation at the shoulder-joint by cutaneous flaps was performed, after a few days of preliminary treatment, by Professor Gross, but the patient expired from exhaustion five hours after the operation.

After the soft parts were removed, the tumour was found to be lobulated and to be contained in a perfect periosteal capsule. As may be seen from Fig. 4, it grew principally from the outer and posterior surfaces of the bone the projection from the inner surface being comparatively slight. It surrounded the entire humerus with the exception of two inches of its upper extremity, and three

Fig. 4.



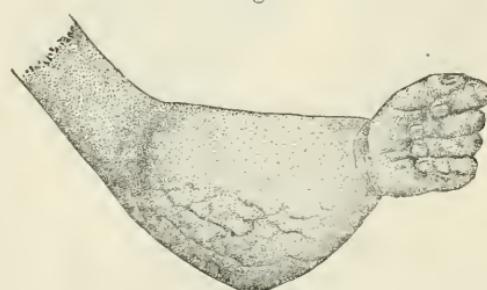
inches of its lower end, and measured seventeen inches in its greatest circumference. On laying open the capsule the great mass of the neoplasm was found to consist partly of a soft pinkish-white or brain-like tissue, dotted here and there with small vascular points, and partly of haematoid substance, which closely resembled an organizing thrombus. Indeed, the likeness to the haematoid variety of medullary sarcoma was most striking. Scattered throughout the tissue, but not in great numbers, were cysts with gelatinous contents. The humerus was fractured at two points, which corresponded with the junction of the middle with the upper and lower thirds, and its surface was deeply eroded, the loose fragment especially presenting a worm-eaten appearance. The overlying muscles were adherent to the capsule, and had a pale and gelatinous look.

Very numerous sections from different portions of the growth disclosed that it was composed of lymphadenoid tissue, which differed in nowise from that delineated in Fig. 2. The muscles adherent to the periosteal capsule had become infiltrated by the elements of the tumour. Their fibres were very friable, and had undergone incipient fatty transformation, as was indicated by molecular infiltration and the absence of transverse striation. The interfascicular connective tissue was pervaded by granular lymphoid cells, the nuclei of which became apparent on the addition of acetic acid; but I failed to discover any participation of the nuclei of the muscles in the morbid action. A few giant cells were found in the tissue which filled the cavities of the eroded bone.

CASE XII. In a second example, which was also under the charge of Professor Gross, the structure was precisely similar. The soft, elastic, pyriform, and slightly lobulated tumour, which was of ten months' standing, and traceable to a blow, surrounded the head of the tibia of a lad fourteen years of age. The skin was thin and shiny, but mobile; the subcutaneous veins were greatly enlarged, and the temperature much elevated. The material of which it was composed had the consistence and appearance of the brain of a newly-born child; but was soft at points, and the seat of extensive extravasations of blood. The boy died, nine months after amputation through the lower third of the thigh, with chest symptoms; and, although a post-mortem examination could not be obtained, it was presumed that the lungs were the seat of metastatic deposits.

CASE XIII. In a third instance, which I saw with Dr. Collins, surgeon to the German Hospital of this city, the tumour was composed of a mass of small, round lymphoid cells, with scarcely any visible intercellular substance, which was pervaded by a large meshed, lozenge-shaped network of capillaries with very thin walls. It was met with in a boy nine years of age, at the site of a fractured ulna, the accident having occurred one year previously. It extended, as may be seen in Fig. 5, from the wrist to the elbow, and measured eight inches and a half more in its greatest circumference than did the corresponding point of the opposite arm. The skin was natural except at the most dependent part of the growth, where it was thin and injected, particularly around a nipple-shaped eminence, where a puncture had been made eight weeks previously. The subcutaneous

Fig. 5.



veins were prominent over the anterior or palmar face of the mass, which was developed principally at the expense of the ulnar aspect of the forearm, being very prominent in front and behind, while the radial side preserved its natural outline. The tumour was fusiform in shape, but more bellied on its ulnar side; its consistence was elastic, and, at points, apparently fluctuating, and its surface was somewhat bosselated. There was neither pain nor tenderness, but the temperature was elevated. The axillary glands were markedly enlarged. After amputation the tumour measured six inches in length and four inches and a half in width. It had developed at the site of the fracture, which was at the middle of the ulna, and was of periosteal origin, although that membrane was lost in the middle of the mass. The upper and lower epiphyses of the bone were not involved. The brain-like tissue, of which the tumour was composed, was soft and easily crushed, undergoing limited cystic transformation, and pervaded by injected vessels and hemorrhagic deposits. Unfortunately the history of the case is incomplete, as Dr. Collins informs me that the boy died of lung symptoms eight months after he removed the limb, and was buried before he was aware of his decease.

CASE XIV. A woman, four months pregnant, and aged thirty-three years, came to my clinic at the Jefferson Medical College Hospital on the 3d of August, 1878, with a soft, fluctuating tumour of the lower extremity of the left femur, which was most prominent internally and posteriorly, there being little enlargement on the outside of the thigh. Its summit was the seat of two bosses, the larger of which was superficially ulcerated to the extent of a twenty-five cent piece. In this situation the skin was thin, red, adherent, and pervaded by small vessels. Elsewhere it was mobile, stretched, and shining. A few subcutaneous veins were enlarged, and there was a gland in the situation of the saphenous opening of the size of a lemon. The temperature, taken with Seguin's surface thermometer, indicated 98° , while that of the sound limb was only 94° . The tumour, which is delineated in Fig. 6, extended six inches and a half above the patella,

and measured ten inches more in circumference than the sound limb. The patient stated that she was seized, without assignable cause, two years previously with spasmodic pain in the situation of the inner condyle, which persisted and increased in frequency, and was followed, eight months subsequently, by the appearance of a small lump, which grew slowly but continuously, until three months ago, when it increased rapidly. At that time she first noticed the glandular enlargement, and one

Fig. 6.



month afterwards the skin broke. The leg was oedematous; the tumour was painful and somewhat tender, and she had lost flesh and appetite. As she declined surgical aid, she returned home unrelieved, and I was subsequently informed that the mass had given way ten days subsequently at the point of ulceration, and had been the seat of fatal hemorrhage. Although there was no minute examination, from a careful study of similar cases I

assume it to have been an example of round-celled tumour. I have, however, not included it in the study of the general pathology of the disease.

As the microscopic appearances, consistence, and degenerations of the periosteal round-celled sarcomas do not differ from those of the central round-celled tumours, they need not detain us. Spontaneous inflammation occurred in only two instances: In that of Poinsot¹ the skin gave way, and a fungus protruded; while in my own case, as I have just observed, the superficially ulcerated integument opened, and profuse bleeding ensued.

Periosteal round-celled sarcomas surround the shafts much more frequently than the epiphyses of the long bones. Their seat in 13 cases was around the

Humerus, shaft,	in 4 cases.
Femur,	" in 2 cases, lower epiphysis in 2 cases.
Tibia,	" in 1 case, upper " in 2 "
Ulna,	" in 1 "
Tibia,	" in 1 "

Ten cases occurred in males, and three in females. In seven, or 54 per cent., the tumour was traceable to traumatism.

The age at which they were first noticed was, in eleven instances, respectively, 7, 10, 14, 14, 19, 25, 27, 32, 32, 36, and 40 years, the average being 23.2 years, or five years earlier than in the central round-celled tumours.

Their growth is usually continuous and rapid. Thus, they may attain the size of a double fist in twelve weeks, or a circumference of thirteen inches more than the sound limb in four months. In the case recorded by Poinsot, on the other hand, a small growth of the shaft of the tibia had existed for several years, and had increased very slowly, when it took on renewed action, and acquired the volume of two fists in six months.

Local infection of the adjacent structures is quite common. The soft tissues were invaded in 50 per cent. of all cases. In two instances the subjacent bone was eroded; in two it was not only eroded, but the medullary canal was the seat of tumour tissue; while in one case,² in which the tumour corresponded to the lower half of the tibia, that bone was destroyed to the extent of two inches, an encysted nodule was discovered in its tuberosity, and the superficial portions of the fibula were ulcerated. Hence, the bone itself is implicated in the disease in 38 per cent. of all instances.

In a remarkable case, recorded by Steudener,³ the knee-joint was perforated by a growth which sprang from the anterior surface of the head of the tibia, and gave rise to diffuse sarcomatous degeneration of the synovial membrane and the subcortal bursa. In an instance of round-celled tumour of the inner condyle of the femur, reported by Bryant,⁴ the growth bulged

¹ Bull. et Mém. de la Soc. de Chir., vol. iii., 1877, p. 208.

² Ibid.

³ Virchow's Archiv, vol. xlvi. p. 500.

⁴ Guy's Hosp. Reports, ser. 3, vol., xxii. p. 318.

into the joint without opening it. In neither case was the cartilage involved. Enlargement of the associated lymphatic glands was observed in 5 cases, or 38.46 per cent. of the entire number. In two of these, the state of the glands was not noticed. In two,¹ it is very probable that they were merely swollen from irritation, as the patients were alive, respectively, fourteen and forty months after amputation of the thigh; while in one,² which was an example of alveolar sarcoma, the femoral glands showed tumour elements.

General dissemination of the disease, or the occurrence of secondary growths, was met with once, and it was presumed to have taken place in three of the eight cases in which the histories are finished. Unfortunately, in none of these was there a post-mortem inspection, but there can be no doubt that the lungs were affected in all. In the case of Labbé³ there was also recurrence in the stump; while in one, recorded by Barwell,⁴ in which excision of the upper portion of the humerus, including its head, was practised for a growth of eleven weeks' standing, in a lad, aged ten years, the disease returned about the acromion process in three weeks.

All of the cases of periosteal round-celled sarcoma were subjected to operation, save one, which ran a natural course; but its history is too incomplete to be of any service. Of the remaining twelve, ten underwent amputation and two excision, the latter being confined to the shoulder-joint, and in both there was recurrence in the stump as stated above. Of the twelve cases, in four the histories are not perfect. Hence, in eight cases, the duration of life, from the first observation of the disease to its termination, varied from two months and a half to five years and one-third, the average having been eighteen months, so that there is no difference in the duration of life of patients afflicted with round-celled tumours, be they of peripheral or central origin. Of the eight cases, in two⁵ death was directly due to surgical measures; one recovered, but died from metastatic deposits at the expiration of thirty-two months;⁶ three⁷ recovered, but died subsequently from supposed systemic infection, respectively, at seven, eight, and nine months; one⁸ was alive with local recurrence at the end of three weeks; and one⁹ remained well for forty months. Hence, six patients recovered from surgical interference, but of these only one remained well without local recurrence,¹⁰ while one died of generalization, and three subsequently succumbed from supposed metastatic deposits. Taking

¹ Cases of Poinsot and Bryant.

² Hutchinson, Trans. Path. Soc., Lond., vol. xxvii. p. 265.

³ Bull. et Mém. de la Soc. de Chir., vol. iii., 1877, p. 211.

⁴ Trans. Path. Soc., Lond., vol. xxvi. p. 168.

⁵ Case XI. p. 358, and Case of Hutchinson.

⁶ Reference mislaid.

⁷ Cases XII. and XIII. p. 359, and Case of Labbé.

⁸ Case of Bryant.

⁹ Case of Barwell.

¹⁰ Case of Bryant.

these statements as the basis upon which to grade the malignity of these growths, it will be perceived that they are destructive to life in 66.66 per cent. of all instances.

Periosteal round-celled sarcomas make themselves known by pain in 55 per cent. of all instances, and by the appearance of a tumour alone in 44 per cent. In 66 per cent. pain is present throughout the entire course of the disease, while it is absent in 33 per cent. The skin is adherent, discolored, or ulcerated in 51 per cent.; the subcutaneous veins are enlarged in 41 per cent.; the temperature is elevated in 33 per cent.; the lymphatic glands are tumefied in 38.46 per cent.; and spontaneous fracture occurs in 7 per cent. of all cases. Pulsation is never present.

Finally, a rapidly-increasing, painful, lobulated, soft, elastic, non-pulsatile, pyriform or fusiform tumour, especially if seated on the shaft of a long bone, occurring at about the twenty-third year, and unaccompanied by fracture, but marked by discoloration of the skin, enlargement of the subcutaneous veins, involvement of the lymphatic glands, and elevation of temperature, may be safely ranked among the periosteal round-celled sarcomas.

2. *Spindle-celled Sarcoma.*

Peripheral sarcomas, composed of fusiform cells, differ clinically from those made up of similar elements of central origin, by their greater frequency in males, by their occurrence at a far earlier age, by their non-pulsation, and by their indisposition to invade the joints. The subcutaneous veins are not so often enlarged; the skin is less liable to be altered; fracture of the involved bone is incomparably less common, while general dissemination is constant, since all the subjects die, sooner or later, of secondary visceral contamination, whether they are subjected to operation or not.

Inflammation of these tumours is so rarely met with that superficial ulceration of the skin occurred in only one instance.¹ They are, however, more disposed to cystic degeneration than are the central growths, through which they may assume a gigantic size, as happened in the case of Langenbeck, which I will quote presently. Mucous cysts are present in 33 per cent. of all instances, while a large cyst containing blood was found in one case,² or in 11 per cent. of the entire number.

Periosteal spindle-celled sarcomas, unlike the peripheral round-celled tumours, surround the epiphyses more frequently than the shafts of the long bones. Their seat in nine cases was around the

Femur, lower epiphysis, in 3 cases, shaft, in 2 cases.

Humerus, " " 2 "

Tibia, upper " in 1 case.

Ulna, lower " " 1 "

¹ Jackson, Trans. Path. Soc. Lond., vol. xviii. p. 215.

² Butlin, Ibid. vol. xxv. p. 210.

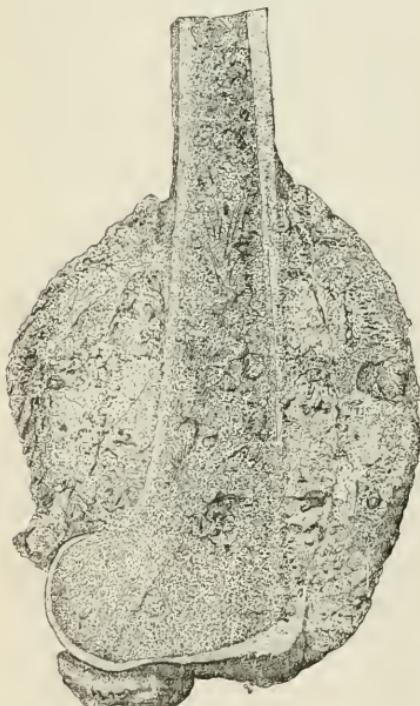
Five cases occurred in females, and four in the opposite sex ; and three, or 33 per cent. were due to traumatism.

The age at which they were first noticed was, respectively, 15, 16, 19, 21, 21, 23, 28, 34, and 41, the average being 24.2, or 12 years earlier than in the central spindle-celled growths.

Their growth is, as a rule, uninterrupted and comparatively slow. In the case of Mr. Nunn,¹ the tumour remained stationary for one month, and at the date of amputation, or three months after its detection, it had increased at the rate of half an inch a week. In the remarkable case of Mr. Jackson,² to which reference will again be made, not only did the further progress of the tumour cease for a number of years, but it appears as if it had developed from a fibroma. Thus, at the age of nine years, a girl detected a small, flat, painless growth, one inch long, on the inner side of the knee, which grew somewhat up to her thirteenth year, and afterwards more slowly, until, at the age of twenty-four, it was of the size of a large walnut. From this date up to her forty-first year, it did not increase a particle, when the woman fell on both knees, in consequence of which it took on renewed activity, and a large medullary tumour resulted.

Local infection of the surrounding tissues and the lymphatic glands is comparatively uncommon. The skin was invaded in one instance ; the

Fig. 7.



muscles in two ; the involved bone was superficially eroded in one, and fractured in one. In none of the nine cases did the disease extend to the medullary canal, and in none was the corresponding joint involved. In a specimen of large spindle-celled sarcoma of the lower end of the femur, however, which is from the cabinet of Professor Gross, but which is devoid of history, the medullary canal, to an extent corresponding to the external tumour, is infiltrated with a pearly tissue, which terminates, as is shown in Fig. 7, above the upper limit of the tumour in a conical mass, which is made up of fragile radiating fibres. At the junction of the shaft with the epiphysis the new tissue has undergone softening, and projecting into the joint from the intercondyloid notch, along the side of the external

¹ Trans. Path. Soc. Lond., vol. xxi. p. 339.

² Ante.

crucial ligament may be seen a pedunculated lobulated growth, of the shape of a kidney and as large as half a hen's egg. In only one instance, that of Mr. Butlin,¹ were the glands enlarged; but as they subsided in great part after amputation, the inference is fair that they were merely the seat of irritative hyperplasia.

Metastatic deposits occurred in four of the five cases in which the histories are complete, while in one there was local return in the stump and the patient died with symptoms indicative of visceral contamination. In the case of Mr. Jackson,² the patient recovered from amputation, but died thirteen months afterwards from secondary growths of the brain. In that of Mr. Butlin,³ which was an example of the hemorrhagic form of the affection, amputation of the thigh was practised for a tumour of the lower end of the femur of eight months' duration. At the expiration of five months, the limb was removed at the hip on account of recurrence in the stump, which was noticed one month previously, or four months after the first operation; but death ensued from presumed secondary disease of the viscera in less than a month. In the case of Allin,⁴ in which disarticulation of the humerus was practised for a tumour of four months' standing, the disease returned in the stump in eight weeks, which fungated, and death occurred six months after the operation. Almost the entire scapula was involved in the recurrent growth, the lungs were pervaded by metastatic tumours, and the retroperitoneal lymphatic glands were extensively involved. In the instance recorded by Mr. Nunn,⁵ in which amputation was done for a growth of the lower third of the femur, which had existed only three months, death ensued from pyæmia on the sixth day, when "enlarged, soft, and dark-coloured glands were found in the groin and in the pelvic and lumbar regions."

The fifth and last example of the general dissemination of the disease, which occurred in the practice of Langenbeck,⁶ is so remarkable that it deserves a somewhat more extended notice.

CASE XV. A man, 23 years of age, in 1855, suffered from rheumatoid pains in the right arm, which prevented him from working. In 1857 he fell and broke the humerus, but the fracture united in four weeks. Six months subsequently, a tumour began to grow rapidly at the seat of the injury, and, in November, 1859, it reached from the neck of the humerus to within three inches of the elbow, and measured three feet in its greatest circumference. The skin was merely greatly stretched, and the tumour was hard at some points and fluctuating at others. The man was very anaemic and had no sleep from pain. After disarticulation at the shoulder, two years and a half after the fracture, the mass was found to be a fibrous sarcoma, containing scattered nodules of cartilage and many cysts, one of which contained a gallon of mucoid fluid. Recovery ensued, but local recurrence soon set in, and on his return in April, 1860, or five months subsequently, when his gene-

¹ Ante.

² Ante, and Trans. Path. Soc., Lond., vol. xix. p. 33.

³ Ante.

⁴ The Medical Record, Feb. 9, 1878, p. 116.

⁵ Ante.

⁶ Langenbeck's Archiv, vol. iii. p. 340, and case 104, p. 306, and Deutsche Klinik, 1860, p. 217.

ral health was much improved, the scapula was found to be involved in a hard tuberous tumour. After preliminary ligation of the subclavian artery, the entire scapula, along with an inch and a half of the acromial end of the clavicle, was extirpated, and the growth was discovered to be of the same nature, but devoid of cartilage or cysts. Death ensued a year and a half afterwards from deposits in the lungs.

All of the patients underwent operation, but in four the histories are too incomplete to be of any use in determining the degree of malignity of these formations. In five, of which I have just given abstracts, there were metastatic deposits, and in three of these there was local recurrence. Hence, periosteal spindle-celled sarcomas may be regarded as the most pernicious of all the sarcomas, as every case is characterized, at some time or other, by malignant features.

The total duration of life from the first appearance of the disease until its termination after operation, varied from three to forty-eight months, the average having been twenty months, or seventeen months less than the mean life of the central spindle-celled tumours.

Periosteal spindle-celled sarcomas usually form dense, hard, smooth tumours, which are, however, soft, or of varying degrees of consistence, and lobulated, when they have perforated their capsules. They are ushered in by pain in 85.7 per cent. of all cases, and by a tumour alone in 14.2 per cent. Suffering is never absent, and at times it is almost unbearable. The skin is variously altered in 22 per cent., and the subcutaneous veins are prominent in 33 per cent. of all cases, while sympathetic enlargement of the lymphatic glands occurs in only 11 per cent. Pulsation is never observed, and fracture from slight causes is found in 11 per cent. of all instances.

Finally, a firm, slowly growing, painful, and non-pulsating tumour, occurring at about the twenty-fourth year, and not attended by fracture, lymphatic involvement, or discoloration of the skin, but with possible enlargement of the subcutaneous veins, may be regarded as a periosteal spindle-celled sarcoma.

3. *Periosteal Osteoid Sarcoma.*

As a result of the remarkable disposition evinced by periosteal sarcomas to undergo calcareous infiltration or ossification of their intercellular substance, a variety has arisen which, even at the present day, is very imperfectly understood, and is generally spoken of as osteoid cancer. In his memoir on the subject, published in 1843, Müller,¹ while recognizing the existence of osteoid carcinoma, described under the name of "Osteoid Tumour," or "Ossifying Fungus," a particular kind of ossifying connective-tissue tumour, which differed histologically from carcinoma, although it gave rise to secondary deposits of a similar nature in the lymphatic glands and the internal organs. Two years subsequently, Lebert² curiously

¹ Müller's Archiv, 1843, p. 396.

² Physiologie Pathologique, vol. ii. p. 231.

enough included the osteoid tumour of Müller among the homœomorphous or benign formations; and Stanley,¹ in 1849, designated the disease "Malignant Osseous Tumour." In their works which appeared between 1852 and 1857, Gerlach,² Paget,³ Schuh,⁴ Wedl,⁵ and Rokitansky,⁶ described the calcifying and ossifying sarcomas as "Osteoid Cancer;" but, in 1858, Volkmann⁷ again made the distinction between osteoid sarcomas and osteoid carcinomas, in which view he was sustained by Virchow,⁸ and since that date the majority at least of so-called osteoid cancers are classed among the sarcomas by the German pathologists.

Among the more recent writers, Green⁹ and Arnott¹⁰ very properly speak of osteoid cancer as a variety of sareoma; while Wilks and Moxon,¹¹ on insufficient grounds, as it appears to me, are inclined to believe that most of these tumours are osteoid chondromata. Cornil and Ranzier¹² describe ossifying sarcomas and ossifying enchondromas, and, with Virchow, treat of osteoid chondroma as a variety of cartilaginous tumour, the structure of which is similar to that found beneath the periosteum of rachitic bones.

To add still more to the existing confusion, Broca¹³ regards these growths as periosteal exostoses developed in cancerous subjects; and Holmes¹⁴ describes a remarkable example of constantly recurring osteoid sarcoma under the title of "Diffused bony, or innocent osteoid, tumour," which is included by Paget in his description of osteoid cancer. Paget,¹⁵ indeed, still believes "that the most probable view of the nature of osteoid cancers would be expressed by calling them ossified fibrous or medullary cancers, and by regarding them as illustrating a calcareous or osseous degeneration." His opinion, however, is based upon the course pursued by the disease, and not upon histological features, since the minute structure, as depicted by him, corresponds in nowise with that of carcinoma. How many of the cases which I have analyzed are included in his history of these growths, I am unable to say; but that he has mistaken sareoma for carcinoma is rendered quite certain by his reference to a case in which microscopic examination, made by Dr. Hillier, disclosed "fibroplastic growths, with abundance of elongated nuclei, and most perfect

¹ A Treatise on Diseases of the Bones, p. 163.

² *Der Zottenkrebs und das Osteoid*, Mainz, 1852.

³ Op. cit., 1st ed., 1853.

⁴ *Path. und Ther. der Pseudoplasmen*, pp. 147 and 425.

⁵ *Grundzüge der Path. Histologie*, 1854, p. 639.

⁶ *Wochenblatt d. Zeitschrift d. Wiener Aerzte*, Jahrg. 3, No. 1, 1857.

⁷ *Bemerkungen über einige von Krebs zu trennende Geschwülste*, Halle, 1858.

⁸ *Deutsche Klinik*, No. 49, 1858, p. 481.

⁹ *An Introduction to Pathology and Morbid Anatomy*, Phila., 1876, p. 114.

¹⁰ *The Histology and Diagnosis of Cancer*, 1872, p. 57.

¹¹ *Lectures on Pathological Anatomy*, Phila., 1875, p. 54.

¹² Op. cit. pp. 129 and 217.

¹³ *Traité des Tumeurs*, Paris, 1866, vol. i. p. 97.

¹⁴ *A System of Surgery*, 2d ed., vol. iii. p. 825.

¹⁵ Op. cit., 3d ed., p. 759.

specimens of fibre cells."¹ In other words, the neoplasm was a calcifying spindle-celled sarcoma.

From his description of its minute appearances, it would appear that the osteoid cancer of Paget is composed mainly of dense fibrous tissue, with which are sometimes mingled, as if imbedded in the interstices of the fibres, cancer cells "not differing from those of common scirrhous cancers in anything, unless it be that they are smaller and less plump." On the addition of acetic acid "the fibrous tissue becomes clearer, and we find abundant nuclei imbedded in it," which are generally oval, and from $\frac{1}{2000}$ to $\frac{1}{3500}$ of an inch in length. From this account I am disposed to regard such a structure as being identical with the fibronucleated tissue of Bennett, which Paget² himself believes to be nearly related to that of the recurring fibroid tumours, and is included by Virchow in his group of spindle-celled sarcoma. That the fibrous tissue should present such peculiar appearances as those shown at *c*, Fig. 126,³ may readily be explained by the fact, as I shall show presently, that the most of these tumours are really examples of fibrous sarcomas, the intercellular fibrous element of which is sclerosed, or thickened and condensed, while the cells have disappeared through fatty changes and atrophy, or have possibly been converted into bone corpuscles. At *b*,³ the fibrous tissue forms a delicate reticulum which is indistinguishable from that of the lymphadenoid variety of round-celled sarcoma, and, I believe, that the tumour from which the drawing was made was, in reality, an example of that form of sarcomatous tissue. In none of these illustrations, nor in the text, is there anything pointing to an alveolar arrangement of the stroma, with included epithelial cells, so that the conclusion is inevitable that the distinguished observer has described osteoid sarcoma under the head of osteoid cancer.

In several of the cases that I have collected with the view of writing the general pathology of osteoid sarcoma, the minute structure agreed with the description of Paget; but the majority consisted of spindle-celled tissue.⁴ Thus, of 21 instances, 14 were of that nature, while 5 were round-celled, and 2 were mixed growths, or composed of spindle and round elements in about equal proportions, thereby confirming the statements of Billroth,⁵ Förster,⁶ Senftleben,⁷ Virchow,⁸ and Carrera,⁹ that they are

¹ Trans. Path. Soc., London, vol. vi. p. 317.

² Op. cit. p. 605.

³ Op. cit. p. 762.

⁴ I have not included in this account cases of osteoid chondroma, in which the tissue corresponds to that of membranous or osteoid cartilage; and I have omitted the cases of Gerlach, in which the minute structure resembled that of carcinoma, although I have every reason to believe that the tumours were osteoid alveolar sarcomas.

⁵ Virchow's Archiv, vol. xviii. p. 87.

⁶ Hdbch. der Path. Anat., 2d ed., vol. i. p. 387.

⁷ Langenbeck's Archiv, vol. i. p. 155.

⁸ Op. cit. p. 298.

⁹ Tumeurs Fibroplastiques des Os, Thèse de Paris, 1865, p. 52.

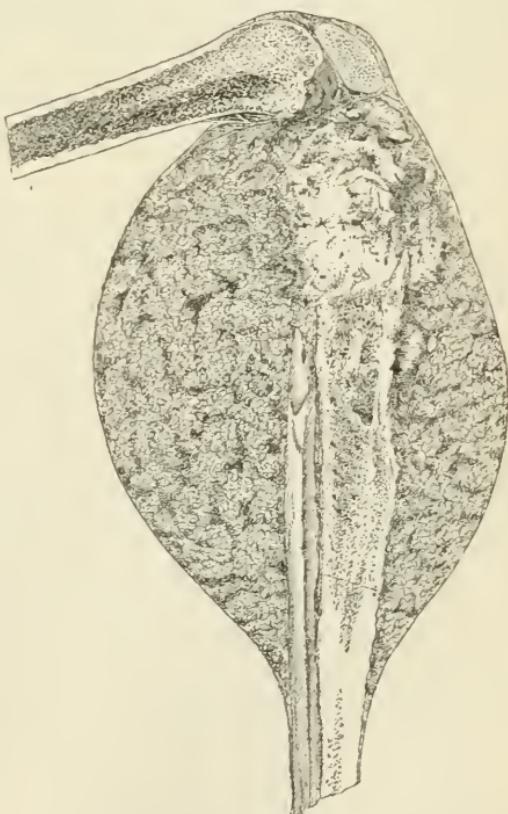
mainly calcified or ossified spindle-celled tumours, and not, as is curiously stated by Cornil and Ranzier,¹ for the most part, myeloid growths.

On section, osteoid sarcomas generally exhibit an interior calcified or ossified structure, surrounded and pervaded by unossified tissue, which may be dense, firm, and glistening, or soft and medullary, like the substance of the brain, or even semifluid and gelatinous. The osseous or cretified material usually radiates from the bone to the periphery of the tumour, in the form of fragile, delicate spicules, tufts, or plates, which are closely aggregated at their bases, and pursue a parallel course perpendicular to the surface of the affected bone, or diverge towards the circumference.

In other specimens, as in No. 317 of the Mütter Museum, the implicated femur looks as if it had been the seat of inflammatory irritation, being much roughened and elevated into thick and short osteophytic vegetations, which are inseparably connected with the compact tissue of the femur, and represent a true hyperplastic process. Again, the ossified portion of the growth may form a huge mass of what looks like spongy bone, as in No. 103, of the humerus. In other examples, the appearances are those of dense ivory-like bone, or, as is illustrated by Nos. 198 of the humerus and 1609 of the tibia, the latter of which is reproduced in Fig. 8, the tumour is principally composed of a collection of large tubers or nodules, which are as fragile as dried mortar.

In the majority of instances, the intercellular substance is simply calcified or petrified, so that the cellular elements are clearly displayed on the addition of chlorohydric acid. In others, or in parts of the same specimen, the tumour is pervaded by imperfect bone. Hence, Grohé² divides osteoid sarcomas into spongoid and ossifying sarcomas; the former being characterized by calcareous infiltration, and the latter by the formation of

Fig. 8.



¹ Op. cit., vol. ii. p. 375.

² Bardleben's Lehrbuch der Chir., etc., 6th ed., vol. i. p. 580.

new bone. Such a distinction, however, is entirely superfluous, since calcification is the initial stage of ossification, and the clinical features and prognosis of both forms are identical, although Cornil and Ranvier¹ erroneously state that ossifying sarcomas are benign affections, while calcifying sarcomas are to be regarded with suspicion.

As happens in the other varieties of periosteal sarcomas, the bone upon or around which the tumour grows is usually not involved in the disease, but in about 40 per cent. of all cases the subjacent medullary canal or spongy substance of the epiphysis is the seat of similar deposits. In some instances the internal and external tumours communicate by an opening in the compact tissue of the bone; but, as a rule, the latter remains entire, although it is sometimes the seat of infiltration, when infection of the marrow seems to have taken place along the Haversian system. These changes are well shown in Fig. 8, in which the head of the tibia and the upper half of the shaft are invaded by the morbid material which originated in the periosteum. From a practical point of view, it should be remembered that the medulla may be affected not only at the immediate seat of the tumour, but at some distance beyond. Thus, in a case of Stanley,² in which amputation was practised in the upper third of the thigh for an osteoid sarcoma of its lower third, on death, a circumscribed nodule was discovered in the bone of the stump; and in a still more remarkable example,³ recorded by that surgeon, of a tumour of the upper portion of the tibia, the entire medullary canal of the femur was occupied by deposits of ivory-like bone.

Osteoid sarcomas are liable to the same degenerations and combinations as are the other varieties of the group. Of these, the most common are the cartilaginous and myxomatous; the former occurring in 20 per cent. and the latter in 12 per cent. of all cases.

They are not very vascular; but in 14 per cent. of all instances,⁴ and especially when they have undergone fatty and myxomatous degeneration, they are the seat of more or less extensive extravasations of blood. Of these, the most striking example is that recorded by Weil, and it is very similar to his case of central hemorrhagic round-celled sarcoma of the humerus, which I have already quoted. The tumour, which was only of six weeks' duration, was converted into a cyst, as large as the two fists, and filled with blood. On attempting to preserve the limb by excision of the sac, twenty-five large arteries and veins required ligation, and the femoral artery had to be taken up before the hemorrhage ceased. On death from consecutive amputation, sixteen weeks after the first appearance of

¹ Op. cit., vol. i. p. 143.

² Op. cit. p. 169.

³ Op. cit. p. 165, and Illustrations, plate 19.

⁴ Cases of Weil, Prager Vierteljahrsschrift, vol. iv., 1877, p. 5; Volkmann, op. cit. p. 19; De Morgan, Trans. Path. Soc., London, vol. xxi. p. 337; Arnott, ibid., vol. xxii. p. 214; and Wagstaffe, ibid., vol. xxiv. p. 183.

the tumour, metastatic deposits were found in the lungs, pleura, liver, kidneys, sternum, and parietal bone. In the case of Wagstaffe, which was also undergoing myxomatous degeneration, large vessels could be traced in close contact with the walls of a huge cyst which occupied the superficial portion of the tumour. The progress of the disease was not, however, so rapid as in the former instance, as the total duration of life was ten months. The lungs, pleura, liver, and spleen were the seat of secondary growths.

In an instance described by Stanley,¹ the femoral artery was tied on account of a pulsating osteoid sarcoma of the lower end of the femur, with the effect of arresting the pulsation and temporarily impeding its growth; and Sedgwick² has recorded a remarkable example of pulsation and bruit seated in a bony metastatic tumour of the clavicle, which appeared to be independent of the subclavian artery. The primary growth was "full of large vessels."

Spontaneous inflammation, ulceration, and fungous protrusion occur in only about 11 per cent. of all cases, these accidents having been observed by Howship,³ Stanley,⁴ Lebert,⁵ and Hillier.⁶ In the case of Howship the fungus was the seat of repeated and exhausting hemorrhages. Ulceration and gangrene are, however, extremely liable to follow surgical interference as for example, the application of the actual cautery, under the supposition that the disease is white swelling, of which occurrence an instance is recorded by Volkmann,⁷ or an exploratory incision or puncture, of which cases are reported by Wilks,⁸ Virchow,⁹ and Volkmann.¹⁰

Peripheral osteoid sarcomas are most common on the bones of the lower extremity, and evince a predilection for their expanded articular ends. Thus of 45 cases of which I have examined specimens or collected histories, the femur was affected in 24, the tibia in 13, the fibula in 2, the humerus in 5, and the radius and ulna in 1.

Of 39 cases in which the sex is noted, 24 occurred in men and 15 in women, 47 per cent. of whom traced the disease to traumatism, and 6 per cent. to rheumatism.

Their greatest frequency is before the thirtieth year. The youngest patient was twelve years of age, and the oldest fifty-five years at the time of the first manifestation of the tumour, the average age being 22.6 years. These facts are set forth in the following table:—

¹ Op. cit. p. 167.

² Brit. and For. Med.-Chir. Rev., vol. xvi. p. 205.

³ Pract. Obs. in Surgery, etc., p. 443.

⁴ Op. cit. p. 167.

⁵ Traité d'Anat. Path., vol. ii. p. 592.

⁶ Ante.

⁷ Guy's Hosp. Rep., ser. 3, vol. iii. p. 155, case i.

⁸ Op. cit. vol. ii. p. 304.

¹⁰ Op. cit. p. 19.

Age.								No. of Case
10 to 20	.	.	.	.	.	.	.	18
20 " 30	.	.	.	.	.	.	.	15
30 " 40	.	.	.	.	.	.	.	3
40 " 50	.	.	.	.	.	.	.	2
50 " 60	.	.	.	.	.	.	.	1
								—
								39

Their growth is progressive and continuous, and usually so rapid that they may attain the volume of a double fist in six weeks¹, or a circumference of twenty-five inches in six months,² particularly if they be the seat of interstitial hemorrhage or mucoid changes. Independently of these alterations, they may be as large as a cocoanut in four months,³ or have a diameter of eight inches in fourteen weeks,⁴ or increase at the rate of half an inch a week.⁵

During their further progress, osteoid sarcomas evince a disposition to extend beyond their limiting capsules and invade the surrounding structures. As I have already pointed out, the medulla of the affected bone is involved in 40 per cent. of all instances. The soft tissues are implicated in 30 per cent., the skin, however, as a rule, preserving its mobility and natural colour, being red, thinned, or ulcerated in only 20 per cent. of all cases. In one case only was a contiguous vein occluded by the morbid material, thrombosis of the axillary vein having occurred in connection with a tumour of the upper end of the humerus.⁶ In 6 per cent of the cases the growth made its way into the adjacent joint, but the cartilages remained intact.⁷

Primary implication of the associated lymphatic glands is recorded in only seven instances, or in 21.87 per cent. of all cases. In four the enlargement was due to irritation; in two the glands were converted into osteoid tissue,⁸ while in the remaining one the structure was not noted.

Not only are osteoid sarcomas locally infectious, but they are next to the pure periosteal spindle-celled the most malignant of all the neoplasms of the osseous system, since 65.62 per cent. of all cases die, sooner or later, with metastatic deposits, no matter whether they have been subjected to operation or not. Thus of 33 instances, of which the terminations are recorded, in 7 the affection pursued a natural course, and of these, in one the viscera was not examined, while in four the internal organs were affected. Of 26 operations, 1 was fatal from septicæmia without metastatic deposits; 6 lived, and 19 subsequently died. In 17 of these the disease was generalized, and in 2 it recurred locally several times.

• ¹ Weil, ante.

² Wagstaffe, ante.

³ Jackson, Trans. Path. Soc., London, vol. xvii. p. 209.

⁴ Küster, Langenbeck's Archiv, vol. xii. p. 630. ⁵ Sedgwick, ante.

⁶ Virchow, op. cit. p. 304.

⁷ Holmes and Volkmann, ante.

⁸ Stanley, op. cit. p. 168, and Paget, op. cit. p. 761.

The duration of life in the 7 cases¹ which ended in death without surgical intervention averaged sixteen months. Two died in the first year; three in the second year; and in two the patients lived only a "short time."

Of the 6² that recovered from amputation, and remained well without local or general return, the average duration of life was 58 months, the shortest period having been seven weeks, and the longest twenty years.

Of the remaining 20 operations³ all of which were amputations, except one instance of ligation of the femoral artery, and one of excision of the upper half of the fibula, strange to say, only one died. The rest recovered and lived for periods which varied from four months to twenty-five years. In 17 of these, metastatic deposits were discovered, and in 7 there was local recurrence at the site of the operation, while 2 died of local recurrence, without any indications of visceral complications. In 13 of these cases, of which I have accurate accounts, the total duration of life averaged 92.7 months, or seven years and eight months. Thus, four died in the first year, three in the second year, one in the fourth year, and one in the sixth year, while one lived for seven and a half years, one for eighteen years, one for twenty-four years; and one for twenty-five years.

In the majority of instances the secondary deposits were also calcified or ossified. Their seat was in the

Lungs	in 16 cases.	Skin	in 1 case.
Lymphatic glands	" 7 "	Liver	" 1 "
Bones	" 7 "	Omentum	" 1 "
Diaphragm	" 3 "	Subcutaneous tissue	" 1 "
Pleura	" 3 "	Spleen	" 1 "
Pericardium	" 2 "	Superior cava	" 1 "
Kidney	" 2 "	Perichondrium	" 1 "
Brain	" 1 case.		

Not only are the periosteal osteoid sarcomas next to the other peripheral varieties more destructive to life than other tumours of bones, but they are more malignant than the central osteoid sarcomas. Thus of 12

¹ Cases of Wilks, op. cit.: case iv. p. 157; Hillier, ante; Volkmann, op. cit. pp. 14 and 19; Küster, ante; Howship, ante; and Virchow, op. cit. p. 304.

² Cases of Norton, Trans. Path. Soc., London, vol. xxiii. p. 179; Nicaise, Bull. et Mém. de la Soc. de Chirurgie, vol. ii. 1876, p. 212; Wilks, op. cit., case of John T., p. 158; Jackson, Trans. Path. Soc., London, vol. xvii. p. 209; Grohe, Bardleben's Lehrbuch, 6th ed., vol. i. p. 582, and Berend, Deutsche Klinik, 1860, pp. 208 and 217, and Virchow, op. cit., vol. ii. p. 313.

³ Cases of Weil, ante; Danzel, Langenbeck's Archiv, vol. xv. p. 72; Verneuil, Bull. de la Soc. Anat., vol. xxix. p. 262; Wagstaffe, ante; Birkett, Guy's Hosp. Rep., ser. 3, vol. iii. p. 336; Paget, op. cit. p. 767; Wilks, op. cit. pp. 155-158; Sedgwick, ante; Stanley, op. cit. pp. 165-168; Senftleben, Langenbeck's Archiv, vol. i. p. 167; Arnott, Trans. Path. Soc., London, vol. xxii. p. 214; Baum, Virchow's Archiv, vol. xviii. p. 86; Bennett, Cancerous and Caneroid Growths, p. 103; and Holmes, ante.

examples of ossifying myelogenic giant, spindle, and round-celled sarcomas 50 per cent. gave rise to metastatic deposits, while 65.62 per cent., of the peripheral form were attended with or followed by systemic infection.

Although generalization may ensue in so short a period as four months, as happened in the case of Weil, it may be deferred for many years, or even not occur at all. Thus in a case of Stanley's,¹ the disease had existed for eighteen years, but on death, two months after removal of the limb, metastatic tumours were found in the pleura, lungs, pericardium, and superior vena cava. In the case of Mr. Plympton, recorded by Paget,²

"a swelling appeared in the upper arm of a woman thirty-two years old. After ten years' growth, when it had increased to seven pounds weight, it was removed by Mr. Hewson. It had the characters of osteoid cancer. The patient completely recovered from the operation; but, about a year after it, a new tumour appeared about the humerus, and at the end of four years had acquired a huge size, and a weight of fifteen and a half pounds. For this, which proved to be a similar osteoid growth, the arm was amputated at the shoulder-joint. She recovered from this operation also; but the disease returned in the scapula, and, in about ten years after the amputation, and twenty-four years from the beginning of the disease, she died."

Not less remarkable is the case described by Holmes:—³

"The thigh was originally amputated on account of a hard and heavy dry osseous substance surrounding the ends of the femur and tibia, projecting into the knee-joint, extending far up the thigh, and surrounding the popliteal artery, vein, and nerve, so as to cause oedema and severe pain. The patient remained well for five years; then another osteoid tumour formed on the stump of the femur, accompanied with severe pain. Amputation was performed higher up. The tumour appeared to grow, not from the bone itself so much as from the periosteum, and inclosed the femoral artery. There was again an interval of health for two years; then a fresh tumour formed about the stump, continued to increase upwards out of reach of operation, and finally killed him from inflammation and sloughing of its soft coverings, twenty-five years after the first appearance of the disease. He had been in good general health during the whole time."

Peripheral osteoid sarcomas begin with pain in 62.5 per cent., with a tumour in 33.33 per cent., and with simultaneous pain and swelling in 4.16 per cent. of all cases. Suffering, which is aggravated by exercise, and liable to severe exacerbations, is so constantly present, that its entire absence is noted in only one instance. In the commencement it is not great, but as the tumour grows, it becomes intense, particularly at night, affects the general health, and is the cause of death in the majority of instances.

Like the uncalcified or unossified periosteal sarcomas, the osteoid variety gives rise to pyriform, or long-oval, oblong, or fusiform tumours, which are smooth and even on their surface, except when they have burst through their capsules, when they are nodulated, bosselated, or lobed. Their consistence is usually firm and dense, although it may be firm at some points and soft and even fluctuating at others. The skin, when the mass is not interfered with, is altered in only 20 per cent. of all cases, being tense

¹ Ante, p. 165.

² Ante.

³ Ante.

and discolored, or ulcerated in about an equal number of instances. Now and then the bony spicules may be seen at the bottom of the ulcer. The subcutaneous veins are enlarged in 31 per cent.; the lymphatic glands are involved in 21 per cent.; the temperature is elevated in 6 per cent.; pulsation is present in rather less than 3 per cent.; and fracture from slight causes occurs in 3 per cent of all cases.

From the above considerations it follows that a hard, rapidly-growing, painful, and non-pulsating tumour, developed at about the twenty-second year, and unaccompanied by fracture or discoloration of the skin, but attended, possibly, by enlargement of the superficial veins and lymphatic involvement, may be classed among the osteoid sarcomas. In the event of an associated gland being densely hard, or of the existence of bony matter in the bottom of an ulcer, its nature is unmistakable.

The Differential Diagnosis of Periosteal Sarcomas.—For purposes of comparison I have drawn up the following table of the clinical features of the periosteal sarcomas, from which it will be seen that there are essential points of distinction. The longer duration of life in the osteoid variety is accounted for by the cases in which the patients lived many years after operation. Were these deducted there would be little difference in the prolongation of life in the three divisions.

	Round-celled.	Spindle-celled.	Osteoid.
Relative frequency	19.40 p. c.	13.43 p. c.	67.16 p. c.
Occur before 30th year	63.63 "	66.66 "	91.66 "
Seated around shaft of the long bones . .	69 "	55. "	39 "
Ushered in by pain	55 "	85.71 "	62 "
" " swelling	44 "	14.29 "	33 "
" " " and pain	0 "	0 "	4 "
Pain throughout the disease	66 "	100 "	98 "
Skin variously altered	51 "	22.22 "	20 "
Subcutaneous veins enlarged	41 "	33.33 "	31 "
Infection of adjacent tissues	50 "	44 "	40 "
Lymphatic glands tumefied or involved .	38.46 "	11 "	21 "
Metastatic deposits	66.66 "	100 "	65.62 "
Local recurrence	50 "	60 "	41 "
Pulsation	0 "	0 "	3 "
Fracture, spontaneous, or from slight causes	7 "	11 "	3 "
Joints invaded	15.38 "	0 "	6 "
Duration of life without operation	?	?	16 mos.
" " with operation	18 mos.	20 mos.	92.7 "
" " " and still alive	34 "	0	58 "

The distinction between the periosteal chondromas and periosteal sarcomas is based upon the following features: The former are relatively far more common, as they constitute 86 per cent. of all cartilaginous tumours of the long bones, while only 41 per cent. of sarcomas are of peripheral origin. They are far less painful, of slower growth, of denser consistence, and are, as a rule, nodulated. They are usually met with in females; do

not occur so early in life, but are met with at a more advanced age than are the sarcomas; and appear, on an average, four years sooner than the latter. The subcutaneous veins are not so liable to enlargement; the overlying integuments evince little disposition to inflame or ulcerate; they do not pulsate, fungate, invade the joints, or contaminate the glands, and they occasion secondary deposits only one-twentieth as often. In about one-third of all cases, moreover, other portions of the skeleton are simultaneously affected, while multiplicity is not witnessed in the sarcomas.

These differences in their principal signs may be the better appreciated by a reference to the following table:—

PERIOSTEAL CHONDROMA.¹

1. Constitutes 86 per cent. of all cartilaginous tumours.
2. Appears between the tenth and sixty-first years, or, on an average, at the age of twenty-six.
3. 63 per cent. of all cases occur in females.
4. Grows comparatively slowly.
5. Usually begins insidiously, but pain is present throughout in 47 per cent. of all cases.
6. The subcutaneous veins are dilated in 21 per cent. of all cases.
7. The skin is variously altered in 10 per cent. of all cases.
8. The lymphatic glands are free from enlargement.
9. Spontaneous fracture, or fracture from slight causes, is met with in 5 per cent. of all cases.
10. Metastatic deposits occur in 3.17 per cent. of all cases.
11. Never pulsates.
12. Does not invade the joints.
13. Is multiple in 32.8 per cent. of all cases.

PERIOSTEAL SARCOMA.²

1. Constitutes 41 per cent. of all sarcomas.
2. Appears between the seventh and fifty-fifth years, or, on an average, at the twenty-second year.
3. 38 per cent. of all cases occur in females.
4. Rate of growth is more rapid.
5. Usually ushered in by pain, and pain throughout in 94 per cent. of all cases.
6. The subcutaneous veins are dilated in 30 per cent. of all cases.
7. The skin is altered in 25 per cent. of all cases.
8. The lymphatic glands are enlarged in 22 per cent. of all cases.
9. Fracture occurs in 5 per cent. of all cases.
10. Metastatic deposits occur in 69.04 per cent. of all cases.
11. Pulsation met with in 1.8 per cent. of all cases.
12. Joints involved in 7 per cent. of all cases.
13. Is never multiple.

In regard to the distinction between periosteal sarcoma and white swelling of the joints, I have nothing to add to what I have already stated in my remarks upon sarcoma in general.

When it is remembered that not only the soft parts and the corresponding portion of the medulla of the bone around which the tumour is seated,

¹ Based upon an examination of sixty-three cases.

² Based upon an examination of fifty-six cases.

are liable to be invaded by the morbid product, but that nodules of sarcomatous tissue may exist in the medullary canal at some distance from the original growth, the line of practice to be followed in the periosteal sarcomas is to amputate as far as possible from the seat of the disease as may be consistent with the patient's safety. Thus, for example, the limb should be removed at the knee for a tumour occupying the lower end of the tibia or fibula; the thigh should be amputated close to the lesser trochanter for a growth involving the lower third of the femur; and if the soft tissues or medulla are found to be infiltrated, disarticulation at the hip should at once be resorted to. When the neoplasm is seated near the trunk, the case had best be left to pursue its natural course, since experience shows that local recurrence, as after amputation at the shoulder, nearly always, if not constantly, ensues.

ARTICLE III.

FOUR CASES OF OVARIAN TUMOUR AND ONE OF FIBRO-CYSTIC TUMOUR OF THE WOMB, OPERATED ON UNDER THE SPRAY. By WILLIAM GOODELL, M.D., Professor of Clinical Gynaecology in the University of Pennsylvania.

No operations on the human body offer so much of interest to the profession as those involving the cavity of the peritoneum. The vulnerability of this membrane, the important organs which it contains, and the fatal character of the diseases for the relief of which its sanctity is invaded, make the record of every case imperative.

Again, while antiseptic ovariotomy has been resorted to with wonderful success by Wells, Keith, Thornton, Bantock, Olshausen, Shroëder and by other European ovariotomists, it has been strangely neglected by our own. Isolated cases are the only ones which appear in our journals, and I shall therefore offer no apology for giving my own experience, limited though it be, with antiseptic laparotomy.

CASE I.—J. M., aged 53, and single, reached the climacteric in 1872. In March, 1877, a tumour appeared in the uterine region, which grew rapidly. It gave her no inconvenience except from its bulk. I saw her first early in September, 1878, and found her much emaciated and her abdomen enormously distended by an ovarian cyst. She was otherwise in very fair health, and had come eight miles to see me. The womb lay to the left and behind the tumour. It measured 3.5 inches, but was movable. The operation was performed at 11 A. M., Oct. 27th, in a small private room of the hospital of the University of Pennsylvania, and I was assisted by Drs. J. Ashurst, B. F. Baer, W. L. Taylor, and Richard H. Harte. There were also present Drs. A. H. Smith and W. S. Forbes, and six students.

There being many parietal adhesions the incision was carried up two

inches above the umbilicus. The tumour consisted of one large cyst and many smaller ones. It involved the right ovary, the left one being healthy, but atrophied. A short and broad stalk was transfixated, tied on either side and dropped back into the abdominal cavity. At 8.30 P. M. I found her comfortable, with a pulse of 100, and a temperature of 101.5°.

The next day and the following one she seemed to be doing well, but on Oct. 30th septic symptoms set in. I removed three of the lowest stitches, introduced a flexible catheter, and irrigated the abdomen with a two per cent. solution of carbolic acid. This was repeated, large doses of opium and quinia were given, but to no purpose. She went from bad to worse, and died at 10 P. M., on the 31st inst.

I was very much disappointed at the issue of this case. It was my first one performed under the spray, and every detail of Lister's method was scrupulously carried out, even to the protective, the mackintosh and the antiseptic gauze. The room had been thoroughly cleansed, and a spray of carbolic acid kept up for many hours. The smell of this acid was indeed quite over-powering during the operation. The students present had, at my request, all bathed their persons that morning, and had put on clothes which they had never worn in the hospital wards and in the dissecting rooms. I, indeed, went so far as to forbid the presence of one of the resident physicians, because he had a case of typhoid fever in his wards. No one but myself touched the peritoneum, and I am sure that no poison was lurking about my person. The parietal adhesions were numerous, but readily broken, and not one needed a ligature. As oozing did not take place a drainage tube was not called for. Yet, in spite of the ease being a favourable one, the opération an easy one, fatal septic peritonitis set in. Apart from the fact that the operation was performed in a general hospital, I am at a loss to account for the presence of poison germs. My confidence in antiseptic surgery was somewhat shaken, for I had previously had in the same hospital two cases of ovariotomy, a third of exploratory incision in which malignant disease of both ovaries was discovered, and a fourth of the removal of both ovaries for the cure of a fibroid tumour of the womb. All these operations were performed without any antiseptic precautions whatever, apart from cleanliness. Of these but one case died, and that was one of ovariotomy, in which a slight attack of peritonitis had supervened upon a previous tapping of the cyst.

CASE II.—S. C., a maiden lady, aged 40, was well until three years ago, when she, while drawing water from a well, was hit in the abdomen by the pump-handle. Shortly after this accident she discovered an abdominal tumour, which slowly increased in size until a few months ago, when its growth became more rapid. Her health now began to fail, and she rapidly lost flesh. Severe pains radiated from the pelvic regions, she lost her appetite, and became obstinately constipated. Some weeks ago Dr. A. H. Sheaffer, of Lewistown, aspirated the tumour and removed not more than two ounces of fluid. The tumour was productive of so much distress by its pressure on the bladder, on the rectum, and on the abdominal organs, that the woman was compelled to give up her trade of seam-stressing and to live on the charity of her friends.

On April 30th, Dr. Sheaffer brought her to my office, and I found the following condition: A large but circumscribed tumour occupied the cavity of the abdomen. It yielded an obscure sense of fluctuation, and was somewhat movable. The sound gave a measurement of 2.75 inches to the womb, which evidently had a firm attachment to the tumour, for movements imparted to the one affected the other. The catamenia were regular, they lasted a week without being profuse, and were painful. The woman had grown very thin and her complexion had become muddy. She wore a very dejected expression, and presented the typical *facies uterina*. In view of the slow growth of the tumour, its solidity, its firm attachment to the womb and the very marked facial expression, my diagnosis was that of fibro-cystic tumour of the womb.

After a short preparatory treatment she was, on May 4th, operated upon in a private room at the hospital of the University of Pennsylvania, and I was aided by Drs. B. F. Baer, J. Roberts, W. L. Taylor, F. F. Scott, and B. L. Millikin. The carbolized spray was used, and every other antiseptic precaution taken. A few parietal and omental adhesions were found, but they offered no difficulty whatever. The tumour was of a darker hue than the sac of an ovarian cyst, and was fasciculated with fibrous bands. The colour was purplish rather than the characteristic blue-white or conjunctival blue of an ovarian cyst, and its surface was covered with large ramifying vessels. Palpation gave so distinctive a feeling of fluctuation that I twice tapped it—once with a trocar and once with an aspirator needle. To my surprise a few drachms only of fluid escaped. It was sherry coloured, and coagulated so firmly as to adhere to the vessels in which it had been received. The aspirator-needle wounded one of the large veins of the tumour, and a free and annoying bleeding followed. It could be stopped only by passing two sutures under the vein, above and below the wound.

Since the tumour could not be reduced in size, the abdominal incision was prolonged upward and downward until it reached from the pubic symphysis to very near the ensiform cartilage. As the tumour had no stalk, but sprang directly from the wall of the womb, I was obliged to enucleate it. The wire-loop of an eraser was accordingly thrown around the womb and tightened just enough to stop the circulation, but not enough to injure the flesh. A circular incision was then made through the capsule of the lower portion of the tumour, and, without the loss of a drop of blood, it was enucleated from the womb partly by cutting and partly with the handle of the knife. The cup-like capsule left behind was transfixed and tied on either side, and the wire-tourniquet removed from the womb. As the free end of this artificial stalk presented a raw funnel-shaped cavity large enough to admit a tea-cup, I was afraid that it would seal itself to neighbouring loops of intestines, and thereby produce dangerous obstruction. In order, therefore, to cover the raw surface by peritoneum, the edges were doubled over and stitched together by nine gut sutures. The stalk was now dropped back, and the abdominal wound closed by twenty-three silver sutures, each one of which included the peritoneum. A thick pad of salicylicized cotton-wool was laid over the abdomen, and kept in place by long strips of adhesive plaster. Over all was pinned a flannel binder, and the patient was then put to bed.

For fear of vomiting and of inflammation the woman's food was reduced to the lowest possible amount—about a tablespoonful of milk and lime-water every hour. On the third day there was a slight rise in temperature,

which was controlled by an ice-cap. No other bad symptom occurred, and her convalescence was uninterruptedly good. The dressing kept perfectly sweet for a week, and was not disturbed until the eighth day, when, under the spray, the stitches were removed and a new batch of salicylicized cotton was applied. The tumour was fibro-cystic in character, and full of small cavities like a geode. It weighed seven pounds.

After the fatal result of my first antiseptic case I had made up my mind not to operate in a hospital again, if I could help it, and I tried to get a room in a private house for this woman. But it was impossible, for the landladies asked a price too high for the purse of my patient. Besides, she was not able to pay for a nurse, and in a private house she would not have had the constant medical attendance which is so needful in these cases, and which hospital residents alone can give. So I was obliged to fall back upon the hospital, but with fear and trembling. This time, however, no medical students were allowed to be present, and but two by-standers. The room also was as far from the wards as possible.

I do not for a moment suppose that the blow received from the pump-handle had anything to do with the production of this tumour; but it called the woman's attention to her abdomen, and led her to discover a growth, which had already existed for months. The injury from the pump-handle, together with the morbid concentration of thought, which plays such an important part in the circulation and innervation of the reproductive organs, no doubt caused the rapid development of the tumour.

CASE III.—C. F., a widow of several years' standing, aged 44, began nearly two years ago to feel a lump in her left side. It grew rapidly until it had reached an enormous size, and greatly distressed her for breath. I was finally asked by her family physician, Dr. J. G. Bauman, of Telford, Pennsylvania, to operate. As she lived some forty miles out of the city, and as she was too unwieldy to come to me, I saw her for the first time on the day of the operation, the 31st of last May. The day was an excessively hot one, the temperature being 93° , and the room in which we operated a small one. I found a short woman, enormously distended by a tumour, which yielded no positive sense of fluctuation. The abdomen was fat-laden and œdematosus. The cervix uteri protruded from the vulva, and the sound gave a measurement of five inches. As she continued to menstruate, and had never been tapped, the diagnosis was by no means certain, and, in fact, it rather leaned towards a fibro-cystic tumour. She was very nervous, and there came to comfort her a lady from whom the late Dr. Atlee had, some years before, removed an ovarian tumour. Her presence did the poor woman much good. The following gentlemen were present at the operation, the four former kindly giving me their aid: Drs. J. Thomas and I. S. Moyer, of Quakertown; J. E. Bauman, of Telford; B. F. Baer, of Philadelphia; W. Hartzell, Reinhard Keeler, V. Z. Keeler, and Henry G. Groff, of Harleysville, Pennsylvania.

Under the spray the abdomen was incised, and the tumour brought to view. There were many tough parietal and omental adhesions. All within reach were broken, and the cyst was tapped, but no fluid escaped. It was, therefore, incised, and the extremely tenacious, jelly-like contents were scooped out with the hands. As the tumour was polycystic, all could

not be removed, and, while I was breaking up the more deeply-seated adhesions, I found a large rent in the cyst, out of which protruded a mass of the colloid substance as large as my fist. Fearing it would escape into the peritoneal cavity, I enlarged the abdominal incision to a point about three inches above the umbilicus, and succeeded in turning out the cyst without any loss of its contents from the rent. The stalk was short and broad. It was transfixated, tied on each side with carbolized silk, the finest compatible with safety, and dropped back. Three bleeding surfaces on the omentum were tied with carbolized gut, the abdomen was closed by silver sutures, and the wound dressed with dry salicylicized cotton. The cyst and its contents weighed forty-five pounds.

On June the 3d I received a note from Dr. Bauman, in which he wrote: "Our patient is getting along so far without a ripple of trouble. She has had no fever of any account; her abdomen seems not to be tender, nor much distended; her tongue is moist, and so is the surface of her body; her head is clear, and, if she were allowed to converse, she would do so freely." The dressings kept sweet until June 8th, when they and all the stitches but three were removed. At the next dressing, five days later, the wound was found wholly united, and the remaining stitches were removed. A few days later the woman was out of bed.

In this case the advantages of an antiseptic treatment were beautifully illustrated. Apart from the numerous adhesions, of which a more typical example will shortly be given, the belly-wall was fat and oedematous. So much so, indeed, that considerable serum glistening with oil-globules kept oozing out, and I had twice to twist tighter the sutures, which were loosened by the shrinkage of the flesh. Yet the long incision united by the first intention save at three suture points, the dressing kept sweet for a week, and the woman recovered, as Dr. Bauman wrote, "without a ripple of trouble."

CASE IV.—On June 11th, Drs. R. Hornor and J. M. Radebaugh, of Gettysburg, Pennsylvania, sent me a maiden lady of fifty, who about two years before had discovered a growth in her abdomen. On the 2d of last June she had become so unwieldy that these gentlemen tapped her, removing three gallons of a dark fluid, which, however, did not empty the tumour. One large fluctuating cyst remained, lying under the diaphragm, and wholly immovable. My diagnosis was a polycyst with extensive adhesions. The womb, of a natural size, was retroverted, and lay behind the tumour. On the morning of the 14th she took a dose of oil, and at night one grain of opium. The next morning she swallowed another grain of opium and ten grains of quinia. At eleven o'clock the operation was performed in one of the private rooms of the Hospital of the University; Drs. C. T. Hunter and L. Judd being present, and Drs. B. F. Baer, J. M. Radebaugh, W. L. Taylor, C. F. Palmer, and B. L. Millikin aiding me.

Owing to the adhesion of the cyst to the belly-wall there was some difficulty in determining where the peritoneum ended and the cyst-wall began; but this was overcome by cautious dissection, and the use of the uterine sound as a probe. Very firm and extensive adhesions to the omentum and to the abdominal wall embarrassed the dislodgment of the tumour. Some of these were too firm to be broken by the finger, and they were,

therefore, scratched through with Thomas's spoon-saw. The omentum was badly torn in the separation of its attachments, and several shreds of it had to be tied *en masse*. The cyst was found to be the right ovary. The left one proved to be sound. The stalk was short and broad. It was transfixated by a double ligature of silk, and tied on either side. Five gut ligatures were applied to as many bleeding vessels in torn adhesion-bands, but there were several broad oozing surfaces which could not be wholly staunched. I, therefore, did what I had before found efficacious in such cases : I put in a glass drainage tube, closed up the wound, and trusted to the elastic pressure of the flannel binder and of the cotton to stop the bleeding. This had the desired effect, and there was no further trouble.

June 15, 9 P. M. Pulse, 90; temperature, 99.4°; no vomiting; reaction perfect.

16th, 9 A. M. Temperature, 100°; pulse, 94. 9 P. M. Temperature, 101.5°; pulse, 100. Is taking every hour one tablespoonful of milk and lime-water. To reduce the danger of hyperpyrexia an ice-cap was ordered.

17th. Ice-cap kept on; temperature, 99.5°; pulse, 86.

18th. Temp. 98.5°; pulse, 80. The ice-cap being no longer needed was taken off.

19th. The temperature and pulse are the same as when last noted.

20th. Temperature, 98°; pulse, 74.

From this day everything went on so smoothly that there is no need of any special record. On the 22d, the dressing began to yield a slight odour, which, however, was perceived only when my nose was almost touching it. I, therefore, removed it, and also the drainage-tube, which had hitherto been untouched. A teaspoonful of sweet bloody serum escaped from the opening, which was now irrigated with a two per cent. solution of carbolic acid. All this was done under the spray. As the sutures were causing no ulceration, not one was cut. The wound was dressed as before with freshly-prepared salicylicized cotton. Three days later all the stitches were removed, and the lady made so rapid a recovery that, on the fifteenth day from the operation, she went in a carriage to a friend living two miles away from the hospital. On July 19 I was much surprised at meeting her at the Centennial Exhibition Building.

This case furnishes another strong proof of the advantages of antiseptic ovariotomy. In the first place, the parietal adhesions were extensive, and in some places so firm as to resist the finger. The omentum was so closely bound to the cyst, that in the efforts to free it merely a rag of it was left behind; in addition so torn was the little left that one of the gentlemen present compared it to a battle flag that had seen much service. Large oozing surfaces were unavoidably made, yet not an unfavourable symptom occurred, and the drainage-tube, which had been put in in anticipation of trouble, was never once uncorked. Then the long wound in the abdomen, which under ordinary dressings becomes offensive by the third day, kept sweet until the ninth. While this lady was in the hospital, another case was admitted in striking contrast with hers. In a quarrel a very muscular negro received a stab in the belly from a narrow-bladed knife. The wound was a small one, the viscera escaped injury, and yet, in spite of unremitting care, a peritonitis set in, which in eight and forty hours destroyed life. Nothing could better show the difference between the vulnerability

of healthy peritoneum and that of peritoneum changed by adhesions, and thickened by the pressure of a large tumour.

CASE V.—On the 24th of last June I was asked by Dr. L. Deal to see Mrs. J. W. F., who had an ovarian cyst. Dr. Deal had been left in charge by the family physician, who had gone out of town after tapping her. This operation caused an inflammation of the cyst wall, and very formidable septic symptoms had set in. I found her with a pulse of 132, and a very high temperature; with sunken eyes and blue circles around them; with clammy sweats, with such great prostration that she could hardly articulate, and with all the characteristic symptoms of an advanced stage of septicæmia.

There was but one remedy to save life, and that the desperate one of removing the cyst from a person so enfeebled by disease as to make her death on the operating table quite probable. Dr. Deal and I weighed all the arguments pro and con, and decided in favour of the operation. All its dangers were pointed out to the sufferer and to her family. She cheerfully accepted them, saying that if she died she would at least have the satisfaction of knowing that she died without a tumour.

On June 26th, Drs. L. Deal, A. K. Minnich, M. A. Wood, and B. F. Baer aided me in the operation. She had passed a bad night, and looked so desperately ill that my courage almost failed me. Upon opening the abdominal wall, to my great dismay I found the cyst firmly bound to it everywhere. As fast as these adhesions were broken, others turned up, binding the cyst to the viscera. There was not a point on the cyst, not even on its stalk, which was unattached. The pelvic and parietal peritoneum, the bladder, the liver, the intestines, and the omentum were firmly united to it. Many of these adhesion bands were too firm to be broken by the finger. Several patches of the adherent cyst were cut out and left behind. For these purposes I found Thomas's spoon-saw to answer admirably. The right ovary was the one involved; it was a monocyst containing a bucketful of purulent fluid. The walls were thick, but they had become so much softened by inflammatory changes as to tear like blotting-paper. These rents caused the unavoidable escape of some of the fluid into the cavity of the abdomen. At last the pedicle was reached, and that too was found bound down by adhesions. It was freed, transfixed, and tied. Very little oozing took place, and only two or three vessels needed the ligature. A glass drainage tube was put in, and the wound was closed in the usual manner and dressed with salicylicized cotton.

During the operation the woman's condition looked very perilous. Once I thought she would die on the table. After she had been removed to her bed, her pulse was so feeble and the shock so great that we did not expect to see her rally. Hypodermic injections of pure ether in the gluteal region brought her pulse up a little, but she was so low when I left the house, that I had no idea she would live through the night.

Having heard nothing of the case, and firmly believing that the woman was dead, I was much astonished to receive, on June 30th, a telegraphic summons to see her. I reached her bedside early in the afternoon, but found her dying.

From Dr. Deal, who had most skilfully managed the case, I learned that on the morning following the operation, our patient seemed better than she had been for many days. By evening her pulse had fallen below 100, and her temperature to 99.5° . On the third day both pulse and body heat ran up a little, but intra-peritoneal injections of carbolized water

brought them down. She now appeared so well and so bright, that both Dr. Deal and the woman's family were very hopeful. But, early on the fourth day, an uncontrollable diarrhoea set in which rapidly weakened her.

Having had three successful cases in succession, I was naturally anxious to keep up my average, and I must confess to having been very reluctant to interfere in this case. She was so feeble and so ill from blood-poisoning as to make the end seem almost a foregone conclusion, and I operated simply from a strict sense of duty. Yet in spite of the fatal issue, so sure am I that I was right, that under the same circumstances I shall act in the same way. At any rate it is the opinion of all the gentlemen present, that the removal of the purulent cyst prolonged her life, and I believe that she would have lived had not the adhesions proved so formidable.

From these cases it will be seen that Lister's antiseptic method was adopted, with the exception of his dressing. I tried his dressing in the first case of this series, but I was not pleased with it. It is too stiff and bulky. Withal, it must be freshly prepared, and to do this needs time and skill. I therefore decided to try an absorbent and antiseptic cotton wool, which could be readily made at any time, and, with that view, I hit upon salicylicized cotton. It is prepared by steeping absorbent cotton in a hot one per cent. solution of salicylic acid. When thoroughly saturated, the cotton is gently squeezed and dried. After the sutures are twisted, a thick and wide pad of this antiseptic cotton is laid on the wound and gently pressed in between the wires. Long strips of adhesive plaster keep the cotton in place, and over all is pinned a fine white flannel binder.

This dressing seems to me to be the simplest and the best, for, apart from its being a dry one—which to my mind is no mean advantage—the pressure secured by the elasticity of the cotton and by that of the flannel binder, brings the parietal peritoneum in firm contact with the bowels. It thus will often check those stubborn oozings which resist all local staunching. The pressure can be increased and made more efficient by bags of shot laid on the abdomen. In such cases I should always use a glass drainage tube, not only for future intra-peritoneal irrigations if they should become needful, but for the purpose of removing by a long nozzled syringe the bloody fluid which may have collected in Douglas's pouch during the time spent in closing and dressing the wound. The tube also acts as a gauge to indicate whether the oozing has stopped or not.

Codman and Shurtleff's atomizer was the one used, and I can bear witness to its efficiency. It holds water enough for the longest operations, and has the further merit of being supported by a stand, thus dispensing with one assistant and with unsteady hands. Its bulk is its only drawback, and that is a serious one when the operation has to be performed in the country or at the patient's own home.

It will be noted that, in all these cases, the stalk was treated by the intra-peritoneal method—in other words, it was tied and dropped back into

the abdominal cavity. Fine silk was used in preference to gut, because the latter, from slipping, from untying, and from being too short-lived, is a treacherous ligature. Nor does the silk act as a foreign body. It is disintegrated by the growth of lymph cells in its meshes, and, being an animal substance, is absorbed like gut, but by no means so soon. Since the introduction of antiseptic surgery, this mode of treating the stalk has gained many adherents, and it bids fair before long to usurp the place of the clamp. The conscientious researches of Thornton¹ and of Bantock² will do much towards effecting such a change of opinion.

The arguments for and against the clamp and the ligature may be summarized as follows:—

The clamp, by delaying the sealing up of the wound, hinders the main object of antiseptic surgery—the exclusion of poison germs. Sometimes the slough caused by the clamp creeps down the stalk and conveys putrilage into the abdominal cavity. The stalk always becomes united to the abdominal wall, and thus, when short, drags painfully upon the womb. Since the portion compressed by the clamp invariably sloughs off, the oviduct in one-third of the cases remains open, and menstrual fluid will escape for an indefinite period of time from the abdominal cicatrix, making it raw and sore. In my very first case of ovariotomy the pedicle was thus treated, and the oviduct remained open. After two years the fistulous cicatrix became the site of a large vegetating cancerous growth. Six months later it was removed by my friend Dr. W. Hunt, but fatal peritonitis set in.

The intra-peritoneal method fulfils all the requirements of antiseptic surgery, but the objections urged against it are at first blush very plausible. The first one is that the distal end of the stalk is liable to slough off and leave putrilage in the peritoneal cavity. That this is unfounded is proved by the investigations of Drs. Thornton and Bantock. Sloughing rarely happens, because the shrinkage of the stalk so far loosens the ligature as to permit the return of capillary circulation. Then again, the peritoneal banks of the narrow and deep gutter made by the fine silk will bulge over and span the gap. Adhesion takes place between the two, and the blood-vessels, which shoot over from the proximal side of the ligature, will carry life into the distal end. Or, lymph exuded by the irritation of the ligature will throw a living bridge over the gutter. Or, what is least desirable, the raw end of the stalk glues itself to any peritoneal surface with which it lies in contact.

Another objection urged against this method is that, since menstruation is liable to take place from the abdominal cicatrix, *a fortiori* will the same phenomenon take place from the stump when lying within the peritoneal cavity. But this is not so, for when the clamp is used the compressed and

¹ British Medical Journal, January 26, 1878, p. 125, and October 19, p. 594.

² Ibid. May 24, 1879, p. 769.

the distal portion of the oviduct sloughs off, leaving an open tube below. When, on the other hand, the ligature is used, neither the distal nor the compressed portion of the oviduct sloughs away, but they both degenerate into a firm but living plug of cicatricial tissue. The only valid objection to the intra-peritoneal method is the liability of the raw end of the stump to unite itself to a loop of intestine and cause obstruction. This, however, can be avoided, either by stitching the end of the stalk to the broad ligament, as Thornton recommends, or by catching it up by the lowest abdominal stitch, after Bantock, or by resorting to a plan suggested by Lister, and, as far as I can find out, first carried out by myself in Case II., viz., the doubling in of the cut edges of the stalk, and the stitching of them together by fine gut.

In conclusion, while I do not advance my own limited experience, the wonderful results of English ovariotomists and the improved statistics of Continental surgeons prove to my mind that antiseptic ovariotomy has won the day, and that he who does not resort to it withholds from his patients a great safeguard against the most common perils of this operation.

ARTICLE IV.

TREATMENT OF PERTUSSIS BY INHALATION. By J. LEWIS SMITH, M.D., Clinical Professor of Diseases of Children in the Bellevue Hospital Medical College, New York.

DURING last April and May several cases of whooping-cough were received in the quarantine wards of the New York Foundling Asylum, and as treatment by the remedies which are in common use, as belladonna, quinia, and the bromides, had not been as successful in former cases as was desired, we concluded to make trial of inhalations. The spray of the following mixture was inhaled from the steam atomizer, three times daily, and from two to five minutes at each sitting.

R.—Acid carbolic, 3ss.
Potas. chlorat. 3ij.
Glycerinae, 3ij.
Aquaæ, 3vj. Misce.

This treatment commenced about the middle of April, when Dr. J. B. Reynolds was on duty, was continued through May, when I was serving. About twelve cases were thus treated, too small a number, though the result was uniform, to enable us to decide positively as to the utility of the spray. Nevertheless the effect was such as to justify its further trial, and encourage the belief that the atomizer will be found a very useful adjunct to the measures employed, if not more effectual than any other single remedy. The cases were, I think, somewhat milder than the average,

for they occurred in the declining period of an epidemic; still with some of them the spasmodic cough was severe before the instrument was used. The following brief records of seven of these cases will enable the reader to judge for himself of the effect of this treatment.

CASE I.—Daniel, aged 4 years; his condition was first observed and recorded on April 11th, when he had fully developed pertussis. April 12th. Whooped nine times during day and night. 13th. Whooped ten times. The spray was now employed, and there was only one spasmodic cough during the next twenty-four hours. The improvement continued with the use, three times daily, of the atomizer, but the records were not preserved till May 1st, after which they were as follows as regards the cough.

May	1	2	3	4	5	6	7	8	9	10	11
Times of spasmodic cough	2	3	0	1	0	0	0	1	0	0	1

After May 11th the cough was considered cured.

CASE II.—Mary, aged 5 years, was admitted into the quarantine wards on April 15th, the characteristic cough having been first observed on this day. She had severe bronchitis, which was treated on the 16th and 17th. On the 18th, day and night, the paroxysms occurred ten times. The atomizer was then employed three times daily, and the number of daily paroxysms was reduced to at least four, and on some days to one or two, till May 1st, when the number of coughs reached six. The treatment by the spray was continued with the following result:—

May	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Times of spasmodic cough	6	3	0	2	1	0	0	1	0	0	1	1	1	0

CASE III.—John, aged 4 years, whooped for the first time on April 20; and on April 21, day and night, whooped seven times. The spray was now employed, at first about two minutes each time, and afterwards five minutes. The record of the cough, commencing May 1st, was as follows:—

May	1	2	3	4	5	6	7	8	9	10	11	12
Times of spasmodic cough	6	10	5	3	1	0	0	2	0	0	1	1

CASE IV.—Jasper, aged $2\frac{1}{2}$ years, began to whoop April 24th. On April 25th he whooped four times, and on the 26th seven times. The spray was now used, and the cough was so controlled that, after May 1st, it was no longer spasmodic. A daily record being made till May 17th.

CASE V.—Isabella, was admitted May 2d, in the commencement of the spasmodic stage. The cough was severe, producing much congestion of the face. There were nine paroxysms in twenty-four hours. The spray was now used three times daily with the following result:—

May	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
Spasmodic cough	8	2	0	1	1	1	2	1	1	3	4	4	2	3	3	3	1	0	2

After May 28th the spasmodic character of the cough was lost.

CASE VI.—Norma, aged 10 months, began to have the spasmodic cough May 10th. The spray was used without the chlorate of potassium three times daily till May 29th. During the twelve days, ending with May 29th, the paroxysms averaged about six daily. On the 29th the spray containing the chlorate of potassium was employed with the following result as regards the cough:—

May	29	30	31	June	1	2	3	4	5
Times of spasmodic cough	6	4	6		3	2	0	0	0

CASE VII.—Maggie, aged 8 months, first had the spasmodic cough about May 10th. The paroxysms numbered six or eight daily till May 14. On the 14th treatment by the spray was begun, after which the paroxysmal cough was as follows:—

May	15	16	17	18	19	20	21	22	23	24	25	26	27
Times of spasmodic cough	3	4	7	4	5	6	7	8	5	6	6	5	5
May				29	30	31	June	1	2	3	4		
Times of spasmodic cough				4	3	4		2	2	0	0		

In the remaining cases, the histories of which were not so fully recorded, the result was nearly, if not equally good, a result better as regards mitigation of the cough than has been obtained in my practice from the use of any other single remedy.

The chief danger in this disease is in the period of spasmodic cough, and is usually proportionate to the severity of the cough. If the cough is mild, complications, as convulsions, atelectasis, pneumonia, etc., are not apt to occur. Hence the physician very properly endeavours to ameliorate the cough, knowing that in proportion as it becomes mild the prognosis improves, the cough can no doubt be rendered milder and less frequent by a considerable number of medicines, chiefly such as diminish "reflex irritability" and procure sleep. Hence there is a long list of remedies which have been recommended for the cough by physicians of experience. In the Index of Therapeutics, appended to Stillé's and Maisch's *National Dispensatory*, thirty drugs are named which are supposed to be useful in whooping-cough. Agents to diminish the frequency and severity of the cough, the bromides to prevent convulsions, quinia to reduce fever, and support strength, when the bronchial catarrh has extended so as to become a complication, or pneumonia has arisen, the timely use of opium and bismuth, to check intestinal catarrh, and the more general use of stimulants, have in recent years greatly reduced the mortality from pertussis. Therefore cases now have a favourable issue, which, with the different treatment of former times, would inevitably perish. From having been one of the most fatal maladies, fifty years ago, so that in New York one died from whooping-cough in every 76 deaths from all causes, it is now less fatal than almost any other severe contagious malady.

Still most of those remedies, which are in common use, fail to produce that beneficial effect, in certain cases, which we desire and the friends expect, and which results from their use in other cases of pertussis. Belladonna, now so commonly employed, benefits a considerable number of patients, when given in medicinal doses, while there are others, and not, I think, a small minority, in whom its beneficial action is not appreciable. I say in medicinal doses, for most of us hesitate to follow the advice of Brown-Sequard to give belladonna, or rather its active principle, in a dose so large as to produce toxical effects, even delirium, and repeat it as the symptoms abate, so as to keep up this effect for three days, after which, according to him, the cough is no longer spasmodic.

It is obvious that if a spray can be inhaled with perfect safety, which controls the paroxysms, thus enabling us to dispense with the use of active internal agents, except as special indications arise, an important gain will be achieved in the treatment of pertussis; and result of the above treatment encourages the belief that inhalations will yet be more generally used to ameliorate the cough, either that which has apparently been so successful in the Foundling Asylum, or one which experience has shown to be better.

There appears to be an exaggerated sensitiveness of the laryngeal filaments of the pneumogastric in this malady, so that inspiration of air, as in crying or laughing, or a current of cold air passing over the laryngeal surface, or the lodgment of mucus upon it immediately excites the cough, notwithstanding the efforts of the patient to repress it. Belladonna probably does good by diminishing the reflex irritability, and the hypersensitivity of the surface of the larynx.

The good effect of the spray in the above cases seems to me to have been largely due to the carbolic acid, which, when used locally, is known to produce an anaesthetic effect on mucous surfaces, but in one or two instances in which the chlorate was temporarily omitted from the mixture, patients seemed to do better with than without it.

In looking over recent medical literature, to ascertain whether the vapour of carbolic acid, which is not in the long list given by Stillé and Maisch, has been recommended for whooping-cough, I find attention called to it in a paper published by Dr. Seemon in a St. Petersburgh journal, an abstract of which appeared in the *Monthly Abstract of Medical Science* for June, Dr. S. recommends that a 5 per cent. solution of the acid be inhaled from woollen material saturated with it and hung around the bed. This mode of its use, I presume, is less effectual than its employment by the atomizer, while it is more disagreeable to attendants.

But however desirable it may be to ameliorate the cough, sustaining measures are required in most cases during the spasmodic stage and in convalescence. I have found beef, wine and iron, as now prepared by pharmaceutists, very useful for these patients, given in teaspoonful doses, every two hours, to a child of two years.

ARTICLE V.

HOW LONG MAY A FŒTUS LIVE IN UTERO AFTER THE DEATH OF ITS MOTHER?

By ROBERT P. HARRIS, A.M., M.D., of Philadelphia.

In view of the possibilities of saving alive the children of women who have died in advanced pregnancy, this question is one of considerable importance. We may suppose ourselves in attendance upon a patient who

has been killed, has died suddenly by disease, or has perished after a lingering illness; she has been pregnant seven, eight, or nearly nine months. What is the prospect of saving her child by an immediate delivery under the knife, or *per vias naturales*?

Again, we do not see her, perhaps, until she has been dead fifteen minutes, half an hour, an hour, two hours, or more. Is there any use in opening her body in the hope of finding the fœtus alive? Can we put any faith in the cases of remarkably prolonged preservation of life in the uteri of dead women; such as have from time to time appeared in old books and journals, the reports claiming the removal of living children after eighteen, twenty-four, and even forty-eight hours?

This subject has been brought to my mind more particularly of late by the receipt of an old Peruvian record, kindly translated for and sent to me by Dr. W. S. W. Ruschenberger, U. S. N., President of the College of Physicians, Philadelphia, which gives an account of one of those marvellous *post-mortem* deliveries of living children, such as the medical world has been time and again called upon to believe, doubt, or entirely discredit, according to the measure of credulity in the reader. The case is an obstetrical curiosity, having in its details the appearance of truth, as such records frequently present; but requiring a large measure of faith to believe in the possibility of its occurrence. The manner of death, by lightning, although marking decidedly the time of dissolution, renders the case still more doubtful, and places it in the list of those commonly regarded as fabulous by all who are not made credulous by ignorance or superstition. The Peruvian statement is as follows:—

“TUCUMAN,¹ January 8, 1795.

“On the 18th of December last (1794), at about half-past five o’clock in the afternoon, a thunderbolt killed a Samba woman who was in the last months of pregnancy. It entered at the middle of her crown, passed out at the right side, and superficially over the rest of her body to the knee. The next day, the 19th, with the consent of the Curate Vicar of this city, Don Joseph Ignacio James, the chief Alcade, Don Pedro Gregorio Lopez, ordered the Cæsarean operation to be performed, in spite of the unwillingness and formal opposition of the relatives of the deceased; and notwithstanding that her head was already fetid, at half-past eleven o’clock A. M., Don Antonio Terri happily performed it in the presence of the Alcade, the Vicar, and other gentlemen who cheerfully concurred in the operation. It was done so felicitously that the fœtus was still alive. It was a boy, and lived a quarter of an hour after it was baptized. There is no doubt that the infant would have lived had the operation been performed immediately after the accident; but the mourners of the deceased preserved a destructive silence, although they observed that the infant was constantly moving in the abdomen. This case proves the importance of the operation, and we should exercise vigilance over people who are heedless on a point so important to the safety of soul and body.” (*Mercurio Peruano*, p. iii. tomo xii., Lima, 1795.)

Had this case occurred in Great Britain, or the United States, where it could have been reliably attested, or had any of the parallel cases in history been free from all suspicious circumstances, we might be prepared

¹ In Laplata, about 1300 miles southeast of Lima.

to believe them; but although there have been many such cases more or less imperfectly recorded, there is not one that is free from the suspicion of being in some measure a fabrication. The death of the woman by lightning, the continuance of muscular activity in the fœtus long after her death, and the escape of the child from being either killed or stunned, give an air of impossibility to the whole story. Although it is not correct, as we are sometimes told, that the blood after death by lightning is usually found fluid, that decomposition commences unusually early, or that there is generally no *rigor mortis*, still the manner of death, and its effect upon the mother, would not favour a prolonged maintenance of an independent existence on the part of the fetus.

Although, as a general rule, the uterus is the last of all the viscera to show signs of decomposition after death, there is a limit to its power of sustaining life in the fœtus, when its sinuses no longer receive oxygenated blood, purified in the lungs of the mother and circulated by the action of her heart. The child in utero is said "to make and circulate its own blood;" which is true in a very dependent sense, the mother furnishing the elements of nutrition and purification, and at the same time eliminating effete and poisonous matters, such as urea, carbonic acid, etc.

If we place a sparrow, as in the experiment of Bernard, of Paris,—which I saw tried by him,—in a three-gallon bell-glass over a dish of mercury, so as to exclude the air, and compel it to breathe that confined within until it has become poisonous by vitiation, we will find at the end of three hours that the bird is still quite active and apparently in health. Now introduce a second sparrow under the bell-glass, and it dies immediately; set the first bird at liberty, and the inhalation of a pure air in its partially asphyxiated state will kill it in a second or two.

The fœtus in the uterus of the dead mother is in a measure poisoned by the impurities in its own blood, like the first sparrow under the bell-glass. It lives on the elements left in the uterine sinuses and in its own blood, until these are exhausted; its blood is no longer purified, and it finally dies sooner or later, as if drowned. Remove the fœtus immediately, and it will in many instances live; put off the delivery a short time, and although the child may be alive, it will generally, after a gasp or two, cease to breathe. Artificial respiration if persevered in, in some cases requiring an hour or more, may prevent death; but unassisted, the fœtus is rarely found on delivery to be in a condition to maintain its existence by the respiratory act.

Theoretically, the manner of death in the mother should have a very decided influence upon the duration of life in the fœtus; and, as a general rule, this proves to be correct also practically; but there are on record many notable exceptions, which it is impossible to account for. *Viability* in these cases is a relative term, having certain rules which are liable at times to be most unaccountably broken. A viable fœtus, obstetrically

considered, should have a measure of vitality, greater or less according to its intra-uterine age and development; but there are to be found some very remarkable exceptions. In lingering and exhausting diseases, the death of the child often, and perhaps in the majority of cases, precedes that of the mother; but the former has been rescued after phthisis ending in haemoptysis, granular degeneration of the kidneys, and in one or two instances even after Asiatic cholera, which was at one time contended to be uniformly fatal to both, if the mother perished. Sudden death in the midst of full health, as from an accident or a violent apoplexy, produces usually the most favourable cases for saving the child by a prompt delivery.

Uræmic eclampsia, although arising from a poisonous condition of the blood, and necessarily in many cases dangerous to the life of the child, is found in practice to be much less fatal, than we would from its character be led to suppose. Quite a number of infants have been delivered alive and saved, where the mothers have died in convulsions, undoubtedly of a uræmic character. We should naturally suppose that the fœtus would be destroyed during the spasmodic movements of the patient; or perish from uræmic poisoning; but it has in quite a number of instances escaped.

Promptness of action is highly important, and the nearer the delivery is to *immediate*, as relates to the time after death, the better will be the prospect for success, although a very large proportion, even of those operated on within five or ten minutes after the decease of the mother will prove to be failures. The child no doubt often perishes, while the accoucheur is determining whether or not the woman is dead; or is persuading the relatives to permit him to open the body.

There are reasons for believing that, under some peculiar and exceptional circumstances, the life of the infant is sometimes prolonged in the uterus of a dead woman, for one, or even as long as two hours; but beyond this, I am not prepared to go, without much better proof than has been given, in the marvellous records of the past. Prolonged life in utero without oxygen, leads us to infer that it must be sustained by some obscure influence, allied to that in the complete hibernation of some of the lower animals, in the state of trance in the human subject, and in cases of prolonged syncope resembling death, in which the functions of the body appear for the time to cease, although the subject is alive, and may be restored to wonted health.

Beyond the limit of two hours, we may find the records of cases claiming life after delivery, when the mother has been dead "several hours," "twenty-four hours," "forty-eight hours," and even beyond this. If a fœtus lives after it has ceased to receive oxygen, it must soon reach the condition in which we find some apparently still-born children; that is, in a perfectly quiescent state. As such have been restored by operations commenced as late, "by the watch," as an hour after delivery, there is reason to believe that life may be prolonged in utero, without proper arterialization, for an analogous period. But while admitting this, I am

not prepared to credit the continuance of muscular activity in utero, when there can be no equivalent for the respiratory act. When we are told, as in the Peruvian report just given, that "the mourners of the deceased preserved a destructive silence, although they observed that the infant was constantly moving in the abdomen," we are at once compelled to doubt the whole story, in view of the fact that muscular movements have rarely been distinguishable beyond fifteen or twenty minutes after the death of the mother, and that artificial respiration is required in almost all cases, even where delivery has been accomplished by an early resort to the knife. In calculating the possibility of life within the uterus of a dead subject, we must be sure that death is an actual condition, and that we are not dealing with a case of suspended animation; for such have been operated on by the Cæsarean section, the child found alive, and the woman has either perished under the knife or has subsequently revived.

Dr. Blundell¹ relates an excellent typical case which came under his own observation in Guy's Hospital.

A woman far advanced in pregnancy, was run over by a stage which crushed her waist, and cut her liver in two parts, causing her death in a few minutes after she reached the hospital. In thirteen minutes after her last respiration, the abdominal section was commenced. In fifteen, the fœtus was out of the uterus, and subjected to restorative measures. Its lungs were inflated by means of the tracheal tube; the warm bath used, and artificial respiration persevered with. In thirteen minutes, the child began to breathe a little, and the umbilical cord to pulsate, and in time restoration was complete.

A careful examination of this whole subject has satisfied me that we can form no *reliable* estimate in any given case, of the prospect of saving the fœtus, from a consideration of the cause of death in the mother, or her previous medical history. All that we can be certain of, is the general rule, that some forms of death are on the whole favourable, and others unfavourable to success. Dr. Blundell² expresses the general belief of the profession, when he says: "If the death of the mother creeps on her gradually, whether from bleeding or other causes, the chance of saving the child by removing it from the body of the deceased parent is exceedingly small. But where the death of the mother occurs in consequence of apoplexy, or some sudden accident incident to the most vigorous health, the probability that the fœtus may survive the mother is much greater."

The question that most concerns us professionally, is the *ultimate* saving of the delivered fœtus. It can be of little satisfaction to us as physicians to remove an immature fœtus, or one for some reason in a non-viable state; have it gasp a few times and then die. "The child is entitled to its own life," and we are if possible to save it, without any special regard to the value of this life in a medico-legal, or it may be religious sense. The triumph of management is the entire restoration of the child, and placing it in a condition to continue to live if properly cared for. The other questions may be important in the eyes of the family, and a valuable aid to us in obtain-

¹ *Obstetric Medicine*, 1840, p. 473.

² *Op. cit.*, p. 472.

ing consent to the operation for removal ; but our business and interest lie beyond these considerations, which give value to a few moments of life. We may save a child long enough to obtain the rite of baptism, or to establish a question of inheritance or succession, and lose it in the end, because having these considerations too much in view, we fail in the degree of perseverance required to secure a durability of existence. The first five minutes after the death of the mother, are often very important to the life of the child, if we expect to save it, and we cannot act too quickly, if the manner of death satisfies us that life is extinct and not suspended. The fear of operating on a still living woman, makes the accoucheur in some instances over-cautious, and causes him to wait until it is too late to save the fœtus. That many children have perished in utero in our country after the death of their mothers, because of their non-removal, there can be no doubt. I know that such have occurred in this city, and one well established instance, was a part of the experience of the late Professor Nathaniel Chapman of the University of Pennsylvania. A lady well-known in fashionable life in Philadelphia, and of plethoric habit, was taken in labour near her full term, the parturition being precipitated by an attack of cold from exposure. In the early stage of labour she suddenly died. Dr. Chapman demonstrated the fact of death to the family, and showed them by the motions of the fœtus, that it was still living. He begged for permission to open the body, that he might save the child, but was positively denied it, although the movements were kept up some fifteen or twenty minutes. A little of the old Roman law, of compulsion under severe penalty, would have been valuable in a case like this. Although not a punishable offence here, it was just as much a murder as the crime of producing abortion is in a healthy woman.

As the case of the Princess Pauline Von Schwartzenberg, of Austria, has been so often reported by obstetrical authors, from Prof. Gardien of Paris, only six years after the occurrence of the accident, down to Dr. W. S. Playfair, of London, in 1878, I have taken some trouble to get at the truth of the matter.

Prof. Claude M. Gardien says (1816) in the second edition of his work on obstetrics, "*All Paris knows*, that the unfortunate Princess Pauline de Schwartzenberg perished from the effect of burns received at a fête, given in the house of the Austrian ambassador, her brother-in-law ; she was pregnant, and the infant was found alive, although she was not opened until the day after the accident." He repeats the same words in his edition of 1824, although he says on the title page that the work has been "*reviewed and corrected*." Prof. Alf. A. L. M. Velpeau quotes the account from Gardien in his own work on obstetrics in 1829, and thus, step by step, the story, on apparently high authority in its beginning, has come down to our day, often doubted it is true, but not substantially contradicted.

History affirms that the Prince gave a grand ball in Paris, in honour of

the wedding of Napoleon Bonaparte and Maria Louisa, on Sunday night, July 1, 1810. In order to accommodate his guests, he had built a temporary ball-room in the garden of the hotel (Montesson) as an annex, and it was in it, that the fire took place. Soon after the dance began, a gauze curtain, at the end of the hall most remote from the door became ignited from a lamp, and in a few minutes the whole structure was in a blaze. All of the guests it is believed had, at one period, escaped, the Princess with her daughter among the last, although some had been seriously injured. The mother and child becoming separated in the confusion, the former fearing for the safety of the latter, in the excitement of the moment, rushed back into the blazing edifice, which, in part, fell in upon her, and she was burned up beyond recognition.

The question in which we are chiefly interested is, to what degree was the body burned? Was the Princess simply injured to an extent to produce death, or was the burning carried to such a degree that the escape of the *fœtus* was an absolute impossibility: for if the body can be shown on reliable authority, to have been destroyed in the fire, then the claim of success in the post-mortem Cæsarean operation fails, as there could have been no fit subject on which to perform it?

Alison,¹ on the authority of the two French historians, Bignon,² and Thibaudeau³ says: "So fierce were the flames, that the place where the unfortunate Princess had perished, could only be discovered by a gold ornament she had worn on her arm, which resisted the conflagration."

Madame Junot,⁴ wife of one of Napoleon's generals, and better known as the Duchesse D'Abrantes, writes very minutely of this disaster, getting her information through letters received in her absence from Paris, written soon after the occurrence. She corroborates the account of the destruction of the body, and says: "Her body, with the exception of her bosom, and part of one arm was burnt to a cinder." She also states that the Princess was only recognizable by a gold ornament, which she describes as a neck-chain and locket, instead of a bracelet.

Here we have four historical writers, all of whom state, that the body said to have been operated upon was burned to such a degree that a post-mortem Cæsarean section could never have been thought of. Had the burns been simply fatal, and the delivery effected as stated, and with the result claimed, the case would not have waited six years before it would have been reported. That there is no authoritative mention of so remarkable an operation in any of the medical journals of the period, and that Prof. Gardien quotes no authority, or gives any names connected with it, is rather strange, if it was ever performed. Certainly he, or Prof. Velpeau,

¹ History of Europe, from 1789 to 1815, vol. iii. p. 335.

² Hist. de France depuis le 18 Brumaire. Paris, 1829, xix. p. 159.

³ Hist. de France pendant la Révolution et l'Empire. Paris, 1835, vol. viii. p. 128-129.

⁴ Memoirs of Napoleon, his Court and Family, Am. edition, N. Y., 1862, p. 356.

would have named the operator, and given more of the points of the case, if any report had ever appeared. The expression, "*all Paris knows*," only applies to the accident; the punctuation, and want of the words *and that*, show that her condition, and the reputed operation, are not included in the general knowledge, as might appear on a casual examination of the original. There is, therefore, not even the authority of a city rumor for the operation and its result; it rests for credence simply on the word of the author, who in the previous sentence tells us, also without reference, of a woman who was assassinated by her husband with a knife, and who was delivered of a living child by the Cæsarean section forty-eight hours after death.

It is not to be presumed that these marvellous reports originated with Prof. Gardien; but it is unfortunate that he should have given them credence, and the value of his name, by the expression, "*Je citerai seulement deux faits*," as preliminary to the two statements. The chief mystery now is, what could have been the motive for fabricating the Schwartzenberg story?

Cæsarean rumors without the least foundation, claiming successful operations on the living, have not been uncommon in the world's history. There was one connected with the birth of Edward VI., son of Henry VIII. of England, in 1537, and I have had to put an end to several in our own country, two of them as long credited locally as the case before us. I am therefore quite incredulous when examining these old marvels, and inclined to look up a case *de novo*, rather than accept it in blind faith.

In view of the statements made, the language of Dr. J. H. Aveling, in a paper read before the Obstetrical Society of London in 1872,¹ sounds rather curiously, when he says, after citing a number of marvellous Cæsarean deliveries: "But perhaps the most extraordinary and best authenticated case is that of the Princess of Schwartzenberg, whose death occurred in Paris in 1810." If his deduction No. 6,—which reads, "after the death of its mother, a child may continue to live in the uterus for many hours,"—has no better foundation than this, I must adhere to the opinion that as yet we have no *reliable* proof of the existence of foetal life in the uterus of a dead woman, beyond two hours: the case may not be impossible, but it is *not proven*.

It is somewhat strange that there should have been at a remote period so many cases in proof of prolonged foetal independence in utero, when there is not one instance in this day of incredulity and more rigid investigation. As teratological wonders repeat themselves in kind, after longer or shorter intervals according to their rarity; so these marvels, if ever genuine, must re-occur at some future day, when they can be attested beyond dispute. Until then, we must hold to the opinion already expressed,

¹ Post-mortem Parturition, Trans. Obstet. Soc. Lond., vol. xvi. 1873, p. 253.

the limit admitted being itself one of extreme rarity. By experiments on the lower animals it has been ascertained that a state of asphyxia sets in soon after the mother is killed, and becomes completely established in a few minutes. In the larger mammalia, as the cow, the fetus has been found alive as late as three-quarters of an hour after accidental death in the mother.

In the human subject, as ascertained from hundreds of post-mortem Cæsarean operations, not one in five infants shows any signs of life when the uterus is opened, and not one in ten lives to be delivered. This is a liberal allowance, when we consider the numbers of cases that have never been reported. The proportion eventually saved is very small, and has not been satisfactorily ascertained.

From private sources of information, I have reason to believe that post-mortem deliveries are much more common in the United States than would appear from published reports; but the practice is much more infrequent than the importance of the operation demands. I believe, also, that we have as yet a very imperfect knowledge of the value and capabilities of resuscitative measures long persevered in, as a means of saving the life of the child. This is made evident by the marvellous results in a few reported cases, where the physician continued his efforts with commendable tenacity, and was rewarded by entire success, when many would have thought his perseverance useless, and advised a discontinuance.

I have purposely avoided in this paper the introduction of tabular statements, extracts of cases, and such other evidences of research, except the few special examples given, as these interruptions only mar the continuity of the text, and detract from its practical character. For this reason my chief points have been made rather deductive than evidential, after having carefully examined the literature of the subject. Those desirous of investigating the matter more critically, and upon points relating to the delivery of the fœtus and its resuscitation, are referred to the paper of Dr. Edward L. Duer, of this city, on "Post-mortem Delivery," in the Jan. number, 1879, of the *Am. Jour. of Obstetrics*; in which will be found a statistical table, and numerous bibliographical references. Dr. Aveling's article before referred to, will also furnish a list of cases, which may be of interest to the searcher after the curious and improbable, in post-mortem obstetrics. Dr. C. Garezky, of St. Petersburg, has made a collection of 379 post-mortem deliveries, and has published his observations in the *Wiener med. Wochens.*, No. 22, 1879. The paper is noticed in the *British Med. Jour.* for June 14th, 1879.

No doubt it would be some satisfaction to know just how many women have been delivered after their death, in the last two or three centuries; what proportion of children extracted alive; and how many of them finally saved: but this would not determine the probabilities and possibilities of the future. The statistics of the past are based upon work often tardily

and imperfectly done; and for this reason, are necessarily very discouraging in their results. We are to endeavour to save life, and to do all that we can with this view; feeling that the result, although very uncertain, is most frequently a failure; that success is determined by no positive rule, and that the most important measure is *haste*. In fact there is not a minute to be lost, and every moment is precious; the foetus is like one drowning: it wants oxygen, and this must be supplied as soon as possible. Is the woman dead? then we cannot be in too much of a hurry to deliver the fetus. Is there any possibility of its being found alive? then we must persevere in our resuscitative efforts until we either restore the child, or are convinced that it is beyond hope. If called in late, open the body, and make sure that the case is, or is not, one of prolonged intra-uterine independence. If there is any possibility of truth in the claims of historical cases, let us test it.

713 LOCUST STREET, Aug. 7, 1879.

ARTICLE VI.

ON CONTUSIONS OF THE CRANIAL BONES. By JOHN A. LIDELL, A.M., M.D., of New York, late Surgeon of Bellevue Hospital, Inspector of the Medical and Hospital Department of the Army of the Potomac, etc. etc.

CONTUSIONS of the osseous tissue are essentially quite analogous to corresponding injuries of the integument or any other soft structure of the body. But, while the bruises of different tissues resemble each other much in general outline, they also differ considerably in important particulars. Thus, in respect to causation, the application of a much greater degree of force is required in order to contuse the hard osseous formations, than that which suffices to contuse the soft structures which invest them externally on the one hand, or are invested by them on the other. The integuments of the head are often severely bruised while the underlying bone escapes all injury. This difference obviously results from the greater solidity and strength of the osseous when compared to that of the soft structures in general. Again, in respect to phenomena, contusion of bone is by no means so constantly attended with ecchymosis as is contusion of the soft parts. Indeed, we but seldom if ever meet with an interstitial extravasation of blood sufficiently copious to constitute what is termed ecchymosis of bone in cases where the osseous tissue is contused, unless the structure is porous or cancellated, as it is in the spongy epiphyses of the long bones, in the short bones, etc. It is probable that ecchymosis does not occur in the compact structure of bone when bruised, because the medullary spaces in that structure are not large enough to hold a sufficient quantity of

extravasated blood to produce the characteristic discolouration. But when the cancellous structure of bone happens to get bruised, ecchymosis not unfrequently appears. The writer published two examples thereof in the number of this Journal for July, 1865, pp. 20-23. With regard to consequences, we find in cases of contusion of bone, especially when the compact structure is involved, that the vitality of the bruised osseous tissue is not unfrequently destroyed outright by the contusing force. Such a result is but seldom produced by contusions of the soft parts, excepting those rare instances wherein the integuments are badly bruised by large fragments of exploding shells, or by the impact of cannon balls whose force is almost spent, and those other cases wherein a thin layer of tissue surrounding the track of musket balls is killed by the stroke of these missiles. Moreover, contusions of bone generally prove much more troublesome in their management, tedious in their course, and fatal in their results, than contusions of soft parts. Of 13 cases of this form of injury, involving several different bones, which have been reported by the writer, 5 died and 8 more or less completely recovered. Of those who died, 3 had simple and 2 suppurative osteo-myelitis; in one of the latter mephitic gangrene of bone occurred just before dissolution. In all of them the osseous tissue was inflamed. In all of them death resulted from exhaustion; one of them, however, had well-marked pyæmia, and at the autopsy secondary abscesses were found in the lungs, spleen, and kidneys, but not in the liver. Of those who recovered, 1 had to undergo amputation of the thigh in order to save his life, 1 suffered necrosis of the tibia with exfoliation of nearly all its shaft, and a majority of the remaining 6 cases had painful, protracted, and exhausting suppuration, with exfoliation of dead bone, and considerable constitutional disturbance of a threatening character. Of the 13 cases of contusion of bone referred to above, the femur was the seat of injury in 6, the tibia in 4, the fibula in 1, the ilium in 1, and the parietal in 1 instance. Of those who died, the femur was the bruised bone in 4 instances, and the fibula in 1 instance. In 11 of the 13 cases, the injury was sustained by a long bone, and in each of the 5 fatal cases it was a long bone also that was injured.

The foregoing summary clearly shows how troublesome and dangerous to life contusions of the long bones of the lower extremities have proved to be; but it is probable that contusions of the cranial bones are more dangerous still, although the instance of the parietal mentioned above terminated in recovery, since the organs contained within the cranium are of much greater importance in the economy of life than those which are placed in relation with the long bones of the extremities. We next proceed to the special consideration of contusions of the bones which enter into the formation of the skull.

And firstly, in order to show the relative importance of this traumatic lesion of the head, we may state that the Army Medical Museum at

Washington contains 246 osteological specimens of gunshot injury of the head, and that included among them "are 22 specimens of gunshot contusion of the cranium" (*Circular No. 6*, p. 10). The examples of contusion constitute about one-eleventh part of the whole number. On referring to the published catalogue of this museum we find that most of these specimens of cranial contusion were obtained from cases which proved fatal. Some of them, however, consist of exfoliations of dead bone obtained from cases that terminated in recovery. Moreover, 328 cases of gunshot contusions of the cranial bones are reported in the *Medical and Surgical History of the War of the Rebellion*, and concerning them it may be stated as a near approximation to truth, that 55, or 17 per centum, died, 98, or 30 per centum, were permanently disabled, and 175, or 53 per centum, recovered (Part First, vol. ii. p. 128). We must therefore consider contusions of the cranial bones as injuries of frequent occurrence and dangerous character in military practice. But this kind of injury also occurs not unfrequently in civil life. Thus, Mr. Prescott Hewett states that "specimens of extensive disease, limited to the outer parts of the calvaria, and caused by a simple blow, exist in the museums of the Royal College of Surgeons and of St. George's Hospital." He also refers to a case mentioned by Dr. Abercrombie in which the inner table alone was thus extensively destroyed; likewise to Norris's case, in which "the disease attacked both tables of the whole of the calvaria, and extended even as far as the foramen magnum;" to Drummond's case, as affording "another example of extensive destruction of the vault of the skull, originating in a blow on the head;" and to Saviard's case as the most extraordinary example of the kind on record, since, "two years after a blow on the head, the whole skullcap came bodily away." The same writer also mentions an extraordinary specimen of hypertrophy of the skull resulting from contusion, which is contained in the museum of the Royal College of Surgeons, and says: "In the vault of this skull the bones are in some parts no less than eleven lines in thickness" (*Holmes's System of Surgery*, vol. ii. pp. 248, 249, 2d ed.). Mr. Pott relates a considerable number of cases of contusion of the skull produced by various casualties to which man is exposed in civil life, that had come under his own observation (*Chirurgical Works*, vol. i. pp. 49-107). Our Army Medical Museum contains a specimen that is classified under the head of injuries not caused by gunshot, and consists of "the vault of the cranium from an epileptic subject, showing necrosis in the right frontal eminence, the evident result of an old injury. The necrosed fragment, of the size of a small bean, is not detached, but the line of demarcation is well marked on both tables. Traces of ostitis, really incipient caries, are apparent for an inch around the central portion" (*Catalogue of U. S. Army Medical Museum*, p. 36, Specimen No. 2230). Besides the foregoing, several examples of contusion of the cranial bones not produced by gunshot will either be related or referred to in the fol-

lowing pages. Moreover, most surgeons of experience have doubtless met with cases in which a blow on the head, unattended with fracture, has been followed by exfoliation of the injured part of the skull, or by suppuration of the diploë (suppurative osteo-myelitis), or by caries (ulcerating osteitis), or by some important pathological condition of the encephalon which had its origin in an inflammation of the bruised osseous tissue.¹

Causes.—Among the more important of the accidents which produce contusion of the cranial bones, we may briefly enumerate the following, namely: The impact of small arms, projectiles, and fragments of shell against the cranial bones, under certain favouring circumstances, blows on the head inflicted with blunt instruments, falls on the head, falling bodies striking the head in their descent, and the kicks of animals against the same part. But, in whatever way the force may be applied to the head, it is necessary, in order for contusion of the osseous tissue to occur, that it should not be so great as to produce solution of continuity or fracture, but still so sudden and violent in its application as to greatly disturb the anatomical relations that naturally exist among the histological elements of which the bone is composed, through a limited space at the place of injury; in other words, the blow must be strong enough to produce a hurtful commotion with crushing or laceration of the bone-corpuscles, the canaliculi, the Haversian canals, the medullary tissue, and the minute bloodvessels belonging to the injured part. In cases where contusion of bone occurs, it is probable that interstitial extravasation of blood almost always occurs, but ecchymosis is not discernible by the unaided eye unless the structure is such that the medullary spaces possess some considerable size, as, for example, they do in the diploë of the cranium, in the spongy tissue of the short bones, and in the epiphyses of the long bones. Hence, the compact osseous structures may be severely bruised without presenting an ecchymosed appearance. In warfare, contusions of the cranial bones are, for the most part, produced by glancing bullets and by those whose force is almost spent. Sometimes, however, they are occasioned by grazing bullets. In cases belonging to the glancing and grazing classes, the missile, if composed of lead, is apt to leave behind it particles of that metal sticking in the bruised osseous tissue.

Consequences of Contusions of the Cranial Bones.—Most of these have already been hinted at, or cursorily mentioned. They pertain either to the injured part of the bone itself, or to the integuments which cover it, or to the structures which lie beneath it; for example, the dura mater, the arachnoid, and the brain-substance. For the purposes of study and description they may be conveniently arranged under the following heads:—

¹ The experience gathered by our army surgeons during the late war of the Rebellion has added very much to our knowledge of cranial contusions. A free use of this experience, and of the important lessons which it conveys, will be made in the following pages.

1. The bruised portion of bone may be suddenly deprived of vitality at the moment of injury, *i. e.*, it may be killed outright by the blow, and thus *primary necrosis* may be produced.

2. Inflammation of a formative character may be excited in the elementary structures of which the injured bone is composed, and thus induration or eburnation and hypertrophy may result.

3. Inflammation of a suppurative character may be excited in the medullary tissue of the diploë, *i. e.*, suppurative osteo-myelitis of the bruised bone, and from this, pyæmia with secondary abscesses in the lungs, liver, etc., may spring; or thrombosis and pulmonary embolism may occur.

4. Inflammation of a destructive character may be excited in the bruised osseous tissue itself, and osteo-porosis, caries, and inflammatory necrosis may be extensively produced, with corresponding exfoliations of dead bone.

5. The inflammatory process may spread from the bruised bone to the dura mater and cause purulent matter to be deposited between that membrane and the bone; or it may spread still further to the arachnoid and the brain-substance, and thus kindle meningitis or encephalitis that quickly proves fatal.

6. Puffy swellings of the scalp, and sub-pericranial collections of purulent matter may form over the inflamed portions of bruised bone. Also, in the cases belonging to this category, erysipelas of the scalp sometimes supervenes.

7. Protracted inflammation of the contused pericranium, or osseous, or medullary tissues, sometimes follows, and in cases produced by gunshot, the wound may reopen at intervals and suppurate, yet no exfoliation take place. In such instances the patient usually has much pain in the injured part.

1. *Primary Necrosis.*—It happens, not unfrequently, in cases where the cranial bones are contused from the impact of musket balls and other small-arms projectiles, that necrosis or death of the bruised portion of bone is directly occasioned by the stroke of the projectile, without the intervention of the inflammatory or of any other pathological process whatever. In such cases the lesion of bone may, with propriety, be denominated primary necrosis, in order to distinguish it from the secondary forms of necrosis, which always have their origin in inflammatory action or in some pre-existent disease. The following case presents us with an excellent example of this important lesion. The writer watched its progress from day to day with lively interest.

CASE I. *Gunshot Wound of Scalp with Contusion of Right Parietal Bone, Inflicted by a Glancing Bullet; Primary Necrosis and Exfoliation of the Bruised Osseous Tissue; Recovery.*—Henry Abbott, Co. B, 32d Maine Volunteers, aged 21, was wounded in the head by a conoidal musket-shot at the battle of Tolopotomy Creek, Va., May 31, 1864, and

taken at once to the 2d division hospital of the Ninth Corps. On June 4, he was admitted to the Stanton Hospital, at Washington, under the writer's charge. The missile struck the scalp over the right parietal bone, passed downward and forward, making a furrowed wound of the scalp about three inches long and then escaped, denuding the bone and exposing the squamous suture in its course. On careful examination we found that the bone was not broken. It was neither fissured nor depressed. The patient's general condition was excellent. He did not exhibit any cerebral symptoms worth mentioning; bowels soluble. *Treatment.*—Quietude, ice-dressing for the wound, tinct. aconiti radicis, gtt. ij, every three hours, and a spare diet.

June 7. He has diarrhoea with six or eight evacuations in twenty-four hours. Prescribed opium, gr. $\frac{1}{2}$; tannin, gr. j; camphor, grs. ij; to be administered after each passage. In a short time the diarrhoea ceased, and his general health continued good. The wound suppurred and discharged laudable pus. It soon presented a florid, healthy appearance, from the formation of new granulation-tissue; but the portion of the skull exposed at its bottom was observed to remain bare and white, and apparently dead.

July 12. Removed a fragment of necrosed bone about one inch in length by half an inch in breadth. It embraced a part of the squamous suture, and consisted of the outer table and the diploë. It was not stained nor altered in structure by the inflammatory or any other pathological process. The wound was filled with healthy granulations, and the patient still had good health. Prescribed the warm water dressing for the wound in place of the ice-bag.

14th. Removed another fragment of neerosed bone about half an inch in length, and corresponding in appearance to that just mentioned. It consisted of the inner table.

17th. Health very good; wound almost healed.

18th. He left Stanton Hospital, having been transferred to the north.

21st. He entered Grant Hospital at Willett's Point, N. Y., whence he was returned to duty on Dec. 21, 1864. The recovery appears to have been complete, as the man's name does not appear on the list of applicants for pension.

This account of the case has been compiled from my own notes, and from the record of it which is given in the *Medical and Surgical History of the War*, at p. 122, vol. ii., Part First.

Comments.—It is worthy of remark that the external table of the skull was necrosed to a much greater extent than the internal table, in this case, and that if the necrosis had been occasioned by fracture, if the fragments of bone which in the end were cast off by exfoliation, had in the beginning been broken off by the impact of the projectile, and separated from the surrounding bone by fissure and depression, just the converse would have obtained; or, in other words, the internal table would have been destroyed to at least an equal, and probably to a much greater extent than the external table. Indeed, the physical properties of the cranium, its density, toughness, and elasticity, are such that in order for an islet of bone to become separated from the surrounding osseous tissue by fracture, it is necessary for it to be driven inward or depressed some distance, and

on the subsidence of the fracturing force, it does not rise up again to its original position or level. Moreover, it is obvious, that in order for depression of the skull in its whole thickness to take place in consequence of fracture, the hole in the internal table must be as large, at least, as the corresponding hole in the external table; and when we also consider that the inner table is more brittle than the outer, and that being situated on the internal arched surface of the skull on the side opposite to the place of impact, the fracturing force drives the external table into the skull and the internal table off from the skull, we must expect to find the internal table much more extensively broken than the external table, in all cases where the vault of the cranium is fractured with depression of an islet of bone.

To what cause, other than the direct action of the bullet on the bruised portion of the cranium, can the necrosis of both tables which occurred in this case be reasonably ascribed? We believe that it was not occasioned by fracture for reasons just given, and for the further reason that a most searching examination of the wound showed the continuity of the skull to be unbroken. We also believe that it was not occasioned by destruction of the perieranium and consequent denudation of the bone, because that lesion is for the most part not attended with the exfoliation of any dead osseous tissue whatever, and in the exceptional cases where it does occur, the exfoliated bone consists of thin lamellæ from the external table, but never of the whole thickness of the cranium. It was not produced by inflammation of the osseous tissue itself, nor by inflammation of the diploë, nor by inflammation of the dura mater, because the clinical history of the case clearly shows that destructive inflammation did not, at any time, exist in these parts. Hence, the conviction is forced upon us that the bruised part of the cranium was killed outright by the stroke of the bullet; and we are confirmed in this belief by the appearance which the exfoliations themselves presented when critically examined. They were white, clean, dry, not discoloured externally nor internally, not altered in structure externally nor internally, and looked exactly like broken fragments taken from the bleached cranium of an ordinary skeleton. The following example belongs to the same category as the above:—

CASE II.—John Yetter, private, Co. A, 11th N. J. Vols. aged 21, was wounded near Petersburg, Va., Nov. 10, 1864, by a conoidal ball which lacerated the scalp and contused the anterior part of the left parietal bone. On Nov. 26th he was admitted to Stanton Hospital, at Washington. There was a necrosis of the cranium one-fourth of an inch in diameter. Low diet and gentle purgatives were prescribed, and, as suppuration became established, emollient poultices were applied to the wound. On Dec. 21st the contused portion of bone was found to be loosened by the process of absorption and suppuration. The patient was placed under chloroform, and, through a crucial incision, a piece of the external table of the left parietal bone half an inch in diameter, and a corresponding piece of the internal table of that bone one-fourth of an inch in diameter,

were extracted. On the 29th, another small piece of bone, consisting of both tables, was removed from the inferior margin of the wound. Water dressings were applied. The patient made a rapid recovery, without any untoward symptoms; but it was thought inexpedient to return him to active service in the field. He did efficient duty for some months as a nurse in the hospital. When discharged on the general muster out of troops, June 15, 1865, he was in excellent health. His name does not appear on the list of applicants for pension. The fragments of necrosed bone are preserved in the Army Medical Museum, and figured in the *Medical and Surgical History of the War*, Part First, vol. ii. p. 123.

Comments.—In this case, the necrosed part was found to be completely separated and detached from the living bone on Dec. 21, *i. e.* forty-one days after the injury was inflicted. The external table was likewise destroyed much more extensively than the internal. Now when a portion of any cranial bone has been killed by contusion, or suffered primary necrosis, Nature proceeds at once to slowly separate and detach the dead from the living osseous tissue, in order that it may be rendered harmless, and expelled from the system. This object is spontaneously accomplished in a beautiful manner by the occurrence of fungating osteitis, that is, by the transformation of the histological elements of the living osseous tissue where it borders upon the necrosed part, into soft, red, medullary or granulation tissue. The calcareous matter disappears under the local excitement occasioned by the dead bone acting as an irritant, the intercellular or basis-substance softens, the bone-corpuscles change into rapidly proliferating medullary cells, the blood-supply is largely augmented, and thus the hard osseous becomes transformed into soft, red medullary or granulation tissue around the necrosed fragment (Virchow). Thus, after the lapse of some weeks, the dead remains connected with the living part of the bone only by an intervening lamina of delicate fleshy granulations formed at the expense of the living osseous tissue. Thus, it happens, that when we examine the dry specimens illustrating necrosis, which are preserved in pathological cabinets, we generally find the cavity to be larger than the necrosed fragments which come from or belong within it. This detachment of the dead from the living bone was completed in the case of Henry Abbott in about six weeks, and in the case just related in about six weeks also. On extracting the loosened necrosed fragment, we usually find its bed covered over with soft florid granulations, which bleed readily and freely on very slight injury; and the gap left in the bone after its removal usually becomes quickly filled up with them.

The following is likewise an example of primary necrosis involving both tables of the skull in consequence of gunshot injury.

CASE III.—John McGuire, private, Co. G, 65th N. Y. Vols. Gunshot contusion of the frontal bone. Antietam, Sept. 17, 1862. Treated in Carver Hospital at Washington. Exfoliation of both tables of the os frontis resulted, and he suffered from neuralgia. He was discharged from service on Oct. 21, 1862, and his name does not appear on the pension rolls. (*Loc. cit.*, p. 104.)

Comments.—The fact that exfoliation of the dead bone was completed in this case within a period of less than five weeks, and that the patient's recovery remained so satisfactory that he did not apply for a pension confirms the opinion that in this case also, the bruised part of the frontal bone was killed outright by the stroke of the bullet. Had this necrosis been consecutive to traumatic inflammation of bone or periosteum, or medullary tissue, the sequestration and discharge of the dead osseous tissue could not by any possibility have been successfully accomplished in this brief period. No, this necrosis could not have been occasioned by any agency other than the blow received from the bullet. Nor is it difficult to perceive how such a blow may destroy the vitality of bony structures, when we take into account the elementary composition of osseous tissue. This kind of injury may instantaneously and completely arrest the nutrition of the bruised portion of bone by stopping the flow into and through it of the nutritive juices and un nutritive material, in consequence of the crushing of bone-corpuseles and canaliculi, and the disruption of Haversian canals, and in consequence of the laceration of capillary bloodvessels contained in the Haversian canals and in the medullary spaces, with which such a bullet-stroke upon the skull is attended, and that, too, without the occurrence of any solution of continuity of the cranium that could properly be termed a fracture. Thus the bruised portion of bone perishes for want of nourishment on the part of its basis-substance and cell-structures.

Again, contusions of the cranial bones, which in respect to severity, fall short of necrosing the whole thickness of the skull, may kill the external table only, or some of the exterior laminæ of that table, at the place of injury; and, generally when the whole thickness of the skull is killed in this way, the external table is much more extensively destroyed than the internal table, as we have already shown. The lighter grades of cranial contusion are sometimes followed by exfoliation of the exterior laminæ whose vitality has been destroyed, not indirectly by detachment of the perieranium, but directly by the contusing force itself. Examples of this sort are not unfrequently produced by blows on the head, and by the kicks of animals on the same part. This form of primary necrosis is also not unfrequently produced in the skull by the impact of gunshot projectiles. The next nine cases are examples in point.

CASE IV.—Wm. McNichols, private, Co. K, 69th Penn. Vols. aged 28. Contusion of the left parietal by a fragment of shell, which lacerated the scalp for three inches or more, Gettysburg, July 2d, 1863. Treated at Mower Hospital, Philadelphia. On August 14th, an exfoliation of the outer table was removed. The patient recovered and was returned to duty on Dec. 16th. His name is not on the pension rolls. (*Loc. cit.*, p. 104.)

CASE V.—Thomas Maxwell, private, Co. K, 5th Michigan Vols., received at the battle of Fredericksburg, Va., December 13, 1862, a gunshot injury of the right side of the cranium; anterior portion. He was,

on December 16th, admitted to the Third Division Hospital at Alexandria. A portion of the outer table exfoliated; otherwise the case progressed favourably, and the patient was returned to duty on May 29, 1863. His name does not appear on the pension list. (*Loc. cit.*, p. 104.)

The next patient was a Confederate soldier, who was treated in the Confederate Hospital at Farmville, Va.:—

CASE VI.—R. Duggins, private, Co. C, 11th South Carolina Regiment, received on June 18, 1864, a gunshot contusion of the left parietal bone. He was admitted to the Confederate Hospital at Farmville, Va., on June 21st. The external table of the parietal exfoliated; otherwise the case did well, and the patient was furloughed on July 8th for sixty days. (*Loc. cit.*, p. 103.)

The patient in the following case was also a Confederate soldier:—

CASE VII.—W. A. Lipscomb, sergeant, Co. C, 5th South Carolina Regiment, was admitted on June 23, 1864, to the Confederate Hospital at Farmville, Va., with a gunshot injury of the right supraorbital region. Gradual exfoliation of the external table followed. The patient was furloughed on July 8th. (*Loc. cit.*, p. 104.)

The next case was likewise treated in the Confederate Hospital at Farmville, Va.:—

CASE VIII.—W. S. Solomon, private, Co. G, 66th North Carolina Regiment, was, on June 20, 1864, admitted to the Confederate Hospital at Farmville, Va., with a gunshot injury of the frontal bone, received on June 18th. Gradual exfoliation of the outer table took place, but the patient did well, and was, on July 8th, furloughed. (*Loc. cit.*, p. 104.)

In the following case the patient was a Confederate officer, who was treated in the Confederate Hospital No. 10, at Richmond, Va.:—

CASE IX.—B. M. Whitmer, captain, Co. G, 3d South Carolina Battalion, received, at the battle of Gettysburg, July 2d, 1863, a gunshot scalp-wound, with contusion of the cranium. He was admitted to the Confederate Hospital, No. 10, Richmond, Va. Exfoliation of the external table took place. Captain Whitmer was furloughed on July 20th. (*Loc. cit.*, p. 105.)

The following case was in the Confederate Hospital at Farmville, Va.:—

CASE X.—J. P. Wilson, lieutenant, Co. B, 9th Virginia Regiment, received, at the battle of Spottsylvania Court House, Va., May 10th, 1864, a gunshot injury of the left parietal bone. The wound of the scalp was about two inches long. He was, on May 24th, admitted to the Confederate Hospital at Farmville, Va. An exfoliation of the bone took place, otherwise the case progressed favourably, and the patient was furloughed on July 1st. He was readmitted on October 1st, suffering from acute dysentery and icterus, and returned to duty on October 29th. The injury of the head gave no further trouble. (*Loc. cit.*, p. 105.)

The exfoliation may be limited to a thin plate of the external table, as it was in the following instance:—

CASE XI.—Franklin Tree, private, Co. A, 20th Maine Volunteers. Contusion and denudation of the vault of the skull for one inch by a musket

ball, Gettysburg, July 3d, 1863. Treated at Seminary and Satterlee Hospitals. A scale of bone exfoliated. The wound then healed, and the man was returned to duty October 23d. His name is not on the pension rolls. (*Loc. cit.*, p. 105.)

The following is an example of contusion and primary necrosis of the skull produced by a buckshot. Some plates of the external table exfoliated.

CASE XII.—Albert Fauck, private, Co. K, 94th Pennsylvania Volunteers, aged 20, was wounded in a skirmish near the Rappahannock by a buckshot, which entered the scalp over the vertex of the cranium, and lodged near the skull. The missile was extracted on the same day. On September 1st, 1862, he was admitted to the Camden Street Hospital, at Baltimore. Some slight exfoliation, not involving the entire thickness of the outer table, took place; then the wound healed kindly, and, on October 11th, the patient was sent to the Convalescent Camp at Fort McHenry for duty. His name does not appear on the pension rolls. (*Loc. cit.*, p. 103.)

Comments.—Primary necrosis results so frequently from gunshot contusions of the skull that additional examples belonging to the same category might readily be adduced from the same sources, but further cumulative evidence on this subject seems unnecessary in this connection. We may, however, with propriety remark that, of the foregoing twelve cases wherein necrosis of the cranium was produced by the stroke of gunshot projectiles, all terminated favourably. The dead portions of bone exfoliated, and the patients, doing well in other respects, usually made in the course of three or four months a good recovery. The histories of the foregoing cases also show that the primary necrosis of the skull thus produced by contusion, is in healthy subjects, and under favourable circumstances for treatment, etc., not only comparatively free from danger to life, but also not attended with much pain or other distressing phenomena. The fungating osteitis which separates the dead from the living bone is not, *per se*, a painful proceeding. It is a purely conservative process, instituted and carried on in such cases for the purpose of protecting the living parts from the deleterious effects of the dead bone itself and of the suppuration with which necrosis is always attended.

But, in unhealthy subjects, and in patients whose hygienic surroundings are bad, or who receive, perhaps unavoidably, inadequate, neglectful, or injurious treatment, primary necrosis of the cranium thus produced by contusion does not always pursue this favourable course to a successful issue. Instead thereof, a destructive inflammation may be lighted up in the contiguous soft parts, attended with great pain and much suppuration; or the inflammatory process in an acute form may be kindled in the surrounding osseous tissue, and speedily produce inflammatory necrosis of some considerable part of the bone which had not suffered from the original injury; or the inflammatory process may spread inward to the membranes of the brain, and induce meningitis, followed speedily by death, with symptoms

of compression of the brain; and, in occasional instances, suppurative inflammation having been excited in the medullary tissue of the diploë, pyæmia occurs, and death results therefrom, long ere the process of exfoliation is completed.

2. *Suppurative Inflammation of the Diploë, or Cranial Osteo-Myelitis, resulting from Contusion of the Skull.*—The effects of blows and other kinds of injury, which simply contuse the cranial bones, are not restricted to the pericranium and the compact osseous tissue thereof. The medullary tissue of the diploë, of the Haversian canals, and of the medullary spaces in general, belonging to the injured portion of bone, also gets bruised at the same time, and in the following manner: The impulse of the blow, or other kind of injury which occasions the contusion, extends to all the layers of tissue which enter into the composition of the injured bone considered as a whole, namely, the pericranium, the external table, the diploë with its canælli full of medullary tissue, and the internal table, and suddenly produces in these several layers more or less strong vibrations which are not rhythmical or harmonious in form, but, on the contrary, are jarring or discordant, since these several structures differ very much in respect to their thickness, toughness, elasticity, and density; and, in the *mélée* thus engendered, the soft medullary tissue belonging to the diploë, to the Haversian canals, and to the medullary spaces in general, suffers most of all, for it is highly vascular, very rich in cell-formations, and destitute of any protecting frame-work of connective tissue. Hence, the inflammatory processes pertaining to contusions of the cranial bones have, for the most part, their starting-point in the medullary tissue. If the injury be slight, and the subject otherwise healthy, the medullary inflammation is formative in character, and results in induration or eburnation of the affected bone, which, however, is apt to be most strongly marked in the external table; but, if the injury be severe, or the subject unhealthy, the medullary inflammation is suppurative in character, and leads to the filling up of the canælli of the diploë and the other medullary spaces with purulent matter. The transformation of the red marrow of the skull, under the stimulus of inflammatory irritation, into pus, is attended with the following phenomena: From afflux of blood it swells up and becomes redder still, the free medullary cells, already granular, multiply themselves with very great rapidity and become more granular still, while, at the same time, the inter-cellular substance softens and soon liquefies: the descendants of the pre-existing marrow cells thus become converted into pus-corpuscles, and the intercellular or basis-substance into liquor puris, or the liquid intercellular material of purulent matter. The following case briefly presents us with an illustrative example.

CASE XIII. *Gunshot Contusion of the Os Frontis: Cephalic Symptoms; Coma; Death; Autopsy; Osteo-myelitis and Osteo-porosis of Injured Part; Meningitis and Cerebral Abscess.*—Ethan A. Crane, musi-

cian, Co. K, 44th New York Volunteers, was wounded at the battle of Cold Harbor, Va., June 3d, 1864, by a conoidal musket-ball, which struck the frontal bone on the right side near the median line and glanced, apparently causing only a flesh wound; the bone was barely bruised. He was admitted to the Fifth Corps Hospital, and, on June 10th, was sent to the Carver Hospital at Washington. The case progressed favourably until June 20th, when grave cephalic symptoms appeared. The patient became comatose within eight hours, and died on June 22d from cerebral complications. The *autopsy* revealed a large abscess in the right anterior lobe of the cerebrum, with meningitis, beneath the seat of injury. The external table of the bone was slightly discoloured and cribiform, while the internal table presented a faint attempt at the formation of a circumscribed area of the effects of osteitis. The diploë was found of a dark yellowish-gray colour, as in cases of osteo-myelitis in the heads of long bones. The pathological specimen is preserved in the Army Medical Museum. (*U. S. Sanitary Commission Memoirs*, First Surgical vol., pp. 317, 318; also *Med. and Surg. History of the War of the Rebellion*, Part First, vol. ii. p. 112.)

Comments.—This patient died on the nineteenth day after the wound was inflicted. The cause of death was meningitis and cerebral abscess, which had resulted from spreading of the inflammatory process previously kindled in the cranial walls by gunshot contusion to the contiguous membranes and substance of the brain. The progress of these cerebral complications toward a fatal issue was very rapid, for coma was developed within eight hours, and death occurred on the second day after the appearance of the first adverse symptoms. On examining *post mortem* the affected parts, the products of inflammation of the membranes and substance of the brain were found beneath the site of injury. Moreover, the bruised portion of the os frontis was found to be inflamed all the way through. The external table, the diploë, and the internal table presented certain alterations in structure and appearance which spring solely from inflammatory action. The medullary tissue of the diploë was suppurating, the compact tissue of the external table was discoloured and cribiform or porous, and the dense tissue of the internal table was beginning to be necrosed; or, in other words, the medullary tissue of the diploë was already in the last stage of the inflammatory process, while the laminæ belonging to the external and internal tables were yet in the first stages of the same process. The conclusion is irresistible that the traumatic inflammation, which was kindled in the bruised portion of the os frontis in this case, had its starting point in the medullary tissue of the diploë, and spread from it to the calcified tissues of the contiguous parts of both tables. But how do we know that the medullary tissue was undergoing suppuration in this case? some may ask. We state in reply, *firstly*, that we are not acquainted with any way in which the deep-red medullary tissue of the diploë can acquire a dark yellowish-gray colour, except by its conversion, more or less complete, into pus, through the agency of the inflammatory process; and, *secondly*, microscopical examinations of the cancellous structure of the

epiphyses of long bones in strictly analogous cases, *i. e.*, cases of inflammatory disorder of this structure wherein the deep-red marrow has also become changed to a dark yellowish-gray hue, have already shown that such change was due to the metamorphosis of red medullary tissue into purulent matter. The writer has repeatedly witnessed such results on examining microscopically such specimens, and he has reported at least one example belonging to this category, together with an excellent chromo-lithograph illustrating the same, in the *U. S. Sanitary Commission Memoirs*, First Surgical vol., pp. 431, 432, 433, and pl. ix. The part figured in the plate consists of the head and a portion of the shaft of the left os brachii, or rather of the surface of a longitudinal section thereof. The microscopic examination of the cancellous structure of the head of the bone is reported as follows: A specimen taken from the midst of the gray surface of the section, and examined under No. 5, objective, and No. 1, eye-piece of Nachet, was found to contain a large quantity of granular matter, the débris of decomposed pus-corpuscles, with here and there a pus-corpuscle itself. Occasionally a medullary cell also was seen; such cells were granular; their nuclei were large and granular also.

A specimen taken from one of the large canelli on the border of the gray surface where it joins upon the red, contained a number of fat vesicles, with a large quantity of free oil in the form of very minute globules.

On making a thin transverse section of the compact tissue of the bone, and examining it with a hand-glass, the Haversian canals were seen to be enormously enlarged, especially near the periphery of the bone (circumferential laminae). In this situation they were so much enlarged as to be easily seen with the unaided eye. These enlarged medullary spaces were stained with the colouring matter of blood (*op. cit.*, p. 433). The next case is, in many respects, similar to the last, while in other respects it is quite dissimilar.

CASE XIV. *Gunshot Contusion of Os Frontis; Cerebral Symptoms; Trephining; Puncturing a Cerebral Abscess; Death; Autopsy; Diploë Carious: Cranial Osteo-myelitis, Osteo-porosis, and Inflammatory Necrosis; No direct connection between the Cerebral Abscess and the Diseased Bone.*—Samuel Altman, private, Co. A, Fiftieth Georgia Regiment, was wounded at the battle of Antietam, September 17, 1862, by a musket ball, which laid bare the os frontis to the extent of two inches in length by three-fourths of an inch in width, without depressing or fracturing the bone. He was admitted into the Convalescent Hospital, Philadelphia, September 27th. The wound granulated rapidly, and the patient was apparently doing well, exhibiting no symptoms of injury of the brain, except that he was sullen and stupid, which was attributed to other causes. On October 6th he complained of headache, chills, and fever, and, on the 8th, cerebral symptoms appeared, and rapidly increased until the 11th, when the indications of approaching dissolution were unmistakable, the pulse being rapid and small, the skin cold, the pupils natural but insensible to light. The patient was etherized, and the operation of trephining performed, in order to evacuate a cerebral abscess that was supposed to exist.

A button of bone was removed, and the brain punctured, giving exit to six or seven ounces of sero-purulent fluid, containing fragments of broken-down brain-tissue, with such force as to spurt three feet from the patient. The effect of the operation was favourable; the skin became warm, the pulse gained strength and was less rapid, the breathing easier, and the patient appeared in every way better. The wound was closed and stimulants administered, but exhaustion followed, and death occurred on October 11th. At the *autopsy*, it was found that the ball had struck the os frontis on the left side, near the coronal suture, two and one-half inches from the middle line of the cranium. The inner table was necrosed over an irregularly circular space, one and one-half inch in diameter, the diploë between the outer and inner tables at this point being carious. There was an abscess, with greenish indurated walls, three inches in diameter, in the anterior lobe of the left cerebral hemisphere. It had burst, and its contents filled the cavities of the brain. There was no pus under the diseased bone on the surface of the brain, and there did not appear to be any immediate connection between the diseased bone and the cerebral abscess. The pathological specimen is preserved in the Army Medical Museum, at Washington. It shows the vault of the cranium, with the disk in place. The internal table is cribriform. The outer table is porous, and discoloured to a slight degree. The pathological specimen is also figured in the *Medical and Surgical History of the War*, Part First, vol. ii. p. 123.

Comments.—The carious state of the diploë mentioned above doubtless signifies that the medullary tissue of the diploë had been destroyed through the transformation thereof into purulent matter, by inflammatory action, and that the cancelli of the diploë were filled with this matter, or, in other words, that cranial osteo-myelitis in a far advanced stage was present. The porous condition which was found in the outer table, and the cribriform condition of the inner table, show that these parts also were inflamed, and that the inflammatory process was of a more recent date in them than the corresponding process in the diploë. This case, then, like the last, is an instance where gunshot contusion of the os frontis occasioned destructive inflammation in the medullary tissue of the diploë, which spread therefrom to the contiguous osseous tissue, producing abnormal porosity and necrosis therein. Again, this man survived his injuries twenty-four days, while, in the preceding case, death occurred on the nineteenth day after the injuries were inflicted. We are, therefore, not surprised to find that the inflammatory process in the bruised bone, as disclosed by the autopsy, was somewhat further advanced in its course, in this, than it was in the preceding case.

But this case *differs* from the preceding in some important particulars. For example, in this case death resulted from an immense abscess of the cerebrum, which had not grown out of, and was in no way connected with, the morbid process in the bruised portion of the skull; while, in the preceding case, death resulted from meningitis and cerebral abscess which had been produced by spreading of the inflammatory process from the contused portion of the skull into the membranes and substance of the brain. It is, however, highly probable that the cerebral inflammation,

which led to the fatal result in this case, was traumatic in respect to origin; and that it was produced by injury done to the brain-substance by the same projectile that bruised the frontal bone. Moreover, the sullenness of manner and stupidity of appearance which this patient was observed to exhibit prior to the advent of alarming symptoms, support this view of his case, since these phenomena were most probably due to concussion of the brain, and his history furnishes us with no occasion on which such concussion could have been produced, except the time when his frontal bone was contused by a musket ball.

The presence of a cerebral abscess as the cause of the alarming symptoms was so strongly suspected, that the cranium was penetrated by trephining at the site of injury, and the brain punctured, giving exit thereby to six or seven ounces of sero-purulent matter containing fragments of broken-down cerebral tissue, which escaped with great force from the opening in the skull. This operation prolonged the patient's life somewhat, but did not avert the fatal issue of his case.

CASE XV. Gunshot Contusion of Os Frontis; Headache; Chills and Vomiting; Trephining; Cranial Osteo-myelitis and Osteo-porosis were found; Delirium; Trombosis of Frontal and Orbital Veins. Coma; Death.—William Attig, private, Co. A, 49th Penna. Vols., aged 25, was wounded near Rappahannock Station, Va., November 7, 1863, by a conoidal musket-ball, which struck his forehead near the left frontal eminence, denuding the bone of its periosteum for about an inch. He was brought to Washington, and admitted to Harewood Hospital on the 9th, complaining of slight headache over the region of the eyes. His pulse was normal, and his appetite poor. On the 17th, chills, with vomiting, supervened, and the eyes became lachrymose. These symptoms continued until the 19th, when he was anaesthetized, the skull laid bare by a crucial incision through the scalp, and pus was found issuing through the denuded bone. The trephine was then applied near the left frontal eminence, giving exit to a small quantity of pus, which was found between the dura mater and the skull. After the operation the patient became free from pain. During the night of the 20th he became delirious, and lay in a stupor nearly all the time, but answered questions correctly. The next morning, the forehead and right eyelids were edematous; the pulse was seventy-five and feeble. On the 23d, low muttering delirium followed, coma ensued, the alvine evacuations became involuntary, and his breathing stertorous. On the 24th, at 11 A. M., the dura mater was incised, giving exit to a small quantity of pus, but no relief was afforded, and death occurred two hours afterwards. The pathological specimen is preserved in the Army Medical Museum. A figure of it is also presented in the *Medical and Surgical History of the War*, Part First, vol. ii. p. 124.

Comments.—The patient in this case complained of pain located in the injured bone when admitted to hospital, on the second day after he had sustained a gunshot contusion of the os frontis, which stripped off the pericranium over a considerable space. Eight days later, chills, vomiting, and head symptoms appeared, which continued for two days, when, on baring the contused bone by a crucial incision through the scalp, pus was

found oozing through the portion thereof that had been denuded by the projectile. The operation of trephining was then performed which liberated a small quantity of pus that was confined between the dura mater and the skull, and gave complete relief from pain. Whence came the purulent matter which was found oozing through the external wound at the site of injury? In all probability, it came from the diploë, and had its origin in suppurative inflammation of the medullary tissue thereof, which had been called into being by the stroke of the missile. On the second day after the operation, the forehead and right eyelids became œdematosus, no doubt in consequence of the frontal and orbital veins having become obstructed with coagula spontaneously formed therein, *i. e.*, in consequence of thrombosis of these veins. On the following day symptoms of compression of the brain appeared; and, one day later still, the dura mater was incised with a view to relieve the cerebrum from compression, but without avail, and two hours afterwards death occurred. This man survived his injuries only seventeen days; and his death was, in reality, due to spreading of the inflammatory process from the bruised bone to the membranes and substance of the brain. The first step, however, in the morbid process which thus eventuated in his death, was the suppurative inflammation of the medullary tissue of the diploë, which was started by the stroke of the musket ball on the frontal bone. Thence, the inflammatory process extended itself to the tables of the skull, producing a porous or spongy condition thereof; and, finally, to the meninges and brain-substance, with a fatal result, as stated above. The next case also belongs to the same category as the last.

CASE XVI. *Gunshot Contusion of Right Parietal; Convulsions and Coma on the sixteenth day; Trephining; Death; Autopsy; Suppurative Osteo-myelitis and Diffuse Meningitis.*—Joseph Resinger, private, Co. E, 151st N. Y. Vols., aged 21, received at the demonstration on Mine Run, Va., Nov. 27th, 1863, a gunshot wound of the scalp, over the right parietal bone. He was brought to Fairfax Seminary Hospital. There was no cerebral disturbance at the time of admission. The pericranium was not removed, and it was hoped that the skull had escaped uninjured. He was allowed to be up and about the wards, and no symptoms of any grave injury appeared until December 13th, when he was suddenly seized, while seated at the supper table, with convulsions, and immediately became unconscious. He was taken to his bed, the skull was bared by incision at the seat of injury, and the trephine applied. Pus was found immediately beneath the bone, and it also oozed from the diploë. It was thought expedient to make five perforations with the trephine, in order to remove the diseased bone, and to give free exit to pus. The convulsions did not recur, but the comatose condition continued, and the case terminated fatally twelve hours after the operation. The *autopsy* revealed diffuse inflammation of the arachnoid and of the dura mater. The dura mater was not incised, as it did not bulge into the perforations made with the trephine. The pus proceeded only from the diploë and from between the dura mater and the skull. The specimen is preserved in the Army Medical Museum,

at Washington, and is figured in the *Medical and Surgical History of the War*, Part First, vol. ii. p. 125.

Comments.—This man also died on the seventeenth day after his wound was inflicted. The cause of his death too was compression of the brain occasioned by the products of diffuse inflammation of the dura mater and arachnoid. The meningitis itself resulted from an extension of the inflammatory process from the diploë to the inner table of the skull, to the dura mater, and to the parietal and viscerai arachnoid. The morbid state of the diploë, with pus oozing from its cancelli, was due to suppurative inflammation of its medullary tissue which had resulted from injury done to that tissue by a gunshot projectile which bruised that portion of the skull. Moreover, meningitis thus induced by spreading of the inflammatory process from the diploë to the membranes of the brain, was one of the most common causes of death after gunshot contusions of the cranial bones among our soldiers during the late war.

CASE XVII. Contusion of the Right Parietal Bone occasioned by falling on the head; Puffy Swelling and Abscess of the Scalp; Convulsions; Coma; Death. Autopsy: Extensive Necrosis; Recent Meningitis; Large Cerebral Abscess; Cranial Osteo-myelitis (chronic).—Corporal Joseph B. Heffler, Co. D, 7th Iowa Cavalry, aged 25, was thrown from his horse at Louisville, Ky., April 15th, 1864, falling between his own horse and that of a comrade, and striking somewhere upon his head. His injury was considered to be of a slight character, although he was badly stunned, and he rejoined his company in a day or two afterward. But he suffered from constant headache until about the 29th of August, when a puffy swelling of the scalp appeared over the right parietal bone. An abscess formed which continued to enlarge until it was opened on November 30th. The patient was then transferred to the hospital at Madison, Indiana. On admission there on December 1st, the abscess was exceedingly painful, his pulse was 90, skin dry and hot, tongue coated, and bowels constipated.

Treatment.—A free incision was made in the diseased scalp; the right parietal bone was exposed and found denuded for the space of six square inches, and in a necrosed state. The wound was dressed with cataplasms of pulvis ulmi; stimulants and a nutritious diet were ordered. On December 21st, the patient being under chloroform, the opening in the scalp was enlarged and the flaps reflected, with a view to remove the necrosed bone; but upon examination it did not seem to be sufficiently separated to justify operative interference. On January 1st, 1865, brain-symptoms of a very marked character suddenly appeared. He had convulsions recurring in rapid succession for two days, and slight coma, which, however, did not become profound until a short time before death. His mental powers were but little impaired, and he was able to converse intelligently up to a few hours before death, which occurred on January 12th. At the *autopsy* a large abscess was found in the right hemisphere of the cerebrum, communicating with the lateral ventricle, and containing several ounces of offensive pus. There were evidences of recent inflammation of the cerebellum and of the meninges of the brain. The right parietal bone was extensively necrosed and perforated in several places at the seat of injury. The walls of the cranium were observed to be very thin. The thoracic and abdominal viscera were normal.

The foregoing account of this most instructive case has been drawn up partly from original notes thereof received by the writer through the hands of Dr. Elisha Harris, and partly from the record of it contained in the *Medical and Surgical History of the War*, Part First, vol. ii. p. 41, where it is reported under the head of "Miscellaneous Injuries."

Comments.—The cranial contusion in the case just related was occasioned, not by a gunshot projectile, but by falling on the head from on horseback. The man also sustained severe concussion of the brain, and was insensible when picked up. However, he soon recovered and returned to duty, and hence his injuries were thought to be but slight. Nevertheless, he afterwards suffered constantly from pain in the head until about the end of August, four and one-half months after the injuries were received, when a puffy swelling of the scalp appeared over the right parietal bone. The interpretation of these symptoms by means of the light thrown upon them by subsequent events in the history of the case, is as follows: The right parietal bone was contused by the fall, and thus traumatic inflammation of a suppurative character was excited in the medullary tissue of the diploë belonging to the injured part of the bone, whereby this tissue was converted into purulent matter and destroyed. Meanwhile the inflammatory process spread over the contiguous osseous laminæ of both tables, reducing them to a porous or spongy condition, and likewise causing several perforations of the bone through which the purulent matter escaped from the suppurating diploë into the pericranial tissue, thereby causing first a puffy swelling, and subsequently an abscess of the scalp which enlarged continually until it was opened by incision some three months afterwards. The headache ceased as soon as the imprisoned matter escaped.¹ Then, as time wore away, the right parietal bone suffered also from necrosis. On December 1st, about three months after the puffy swelling of the scalp made its appearance, the abscess of the scalp which succeeded it was freely incised; the underlying bone was laid bare thereby, and shown to be denuded and *necrosed to the immense extent of six square inches*. Six weeks later still death occurred from compression of the brain which was occasioned by the inflammatory products that had been formed in consequence of the spreading of the inflammatory process from the injured bone to the membranes and substance of the brain.

The porous, spongy, cribiform, or rarefied condition of the compact laminæ of the cranial tables already several times mentioned as a consequence of osteitis is produced in the following way: The inflammatory irritation spreads from the medullary tissue contained in the canelli and the larger canals of Havers, unto the osseous laminæ which lie in contact

¹ There is good reason for believing that the operation of trephining the external table of the skull, as recommended by Abernethy, so as to secure a free outlet of pus from the diploë, had it been performed at this time, *i. e.*, at the end of August, would have arrested the disease at this stage, and thus have saved the patient. For further information on this point read the last pages of this article.

with that tissue, and produces in those laminae softening of the intercellular substance with disappearance of the calcareous salts, and conversion of the bone-cells into marrow-corpuscles, or, in other words, it transforms the contiguous osseous laminae into medullary tissue. The effect of this kind of inflammatory transformation of the osseous tissue is to destroy some of the bony partitions between the cancelli, to diminish the thickness of all that are subjected to its influence, and thus to increase the size of the cancelli, and the medullary spaces, and the Haversian canals.

In the case just related the contused bone was found to have been perforated in several places by the purulent matter that was imprisoned in the diploë, while it was striving to escape from confinement therein. Suppuration here, like all changes attended by an over-production of corpuscular elements, demands space, and sometimes a great deal of space; and the mechanical force exerted by the repeated division and multiplication of the cells is too great to be resisted by the tension of the blood in the vessels when the two forces are opposed to each other in a confined space which is at once inadequate and incapable of expansion. In this way suppuration of the diploë gives rise to the most manifold and profound disturbances of nutrition, especially in the external table, for it derives most of its blood-supply from vessels that run in the diploë.

In the case just related the contused bone was also found to have become extensively necrosed. This morbid condition of the bone was produced in the following manner: As the destructive inflammation of the medullary tissue of the diploë advanced, the inflammatory process which had spread from it to the circumjacent osseous tissue increased in severity, until the capillaries of the Haversian canals became strangled, as it were, by the products of the osseous inflammation itself compressing them against the unyielding walls of these canals. Arrest of circulation, arrest of nutrition, and death or necrosis of the large section of the right parietal bone thus deprived of blood was the necessary consequence thereof. This necrosis was due to ostitis which had itself been acquired from inflammation of the contiguous medullary tissue, and was, therefore, secondary in character. Primary ostitis is a disorder of extremely rare occurrence. As a secondary disorder, however, it is very frequently met with. It follows both medullitis and periostitis, but the former much oftener than the latter. Secondary ostitis in its mildest form leads to the porous or spongy condition of bone above described, in a severer form the newly made granulation-tissue suppurates, and then we have ulceration and perhaps perforation of bone, or caries, while in its severest form it produces necrosis in the way just shown.

The next case is an example of gunshot contusion of the cranium wherein *pyæmia* supervened with a fatal result. It is reported in the *Medical and Surgical History of the War of the Rebellion* (Part First, vol. ii. p. 84) under the head of "Gunshot Wounds of the Scalp."

Nevertheless, the missile bruised the cranial vault in its passage; and the appearances found on *post-mortem* examination showed that the injury of the bone was of much greater importance than the lesion of the scalp.

CASE XVIII.—Private George Gold, Co. I, 155th Penn. Vols., aged 23, was admitted to Harewood Hospital on Oct. 7th, 1864. He had been wounded at Poplar Grove Church, on Sept. 30th, by a musket ball, which struck the scalp, passing from before backwards, tearing up a portion about three inches in length by one inch in breadth, laying bare the skull and denuding it of pericranium for the space of three inches in length and one inch in breadth, through the middle of which the sagittal suture passed, meeting the coronal at the anterior border. The patient was carefully watched for symptoms indicative of cerebral or meningeal inflammation, but none were manifested up to the moment of his death, unless a slight drowsiness, which, at the time, was attributed to the administration of eight grains of Dover's powder, may be so regarded. He was up and about the ward, complaining of nothing except the wound in the scalp, and receiving no treatment except simple dressings, until the morning of Oct. 18th, when he spoke of a slight pain in the left side of the chest, over the lower lobe of the lung. There was some dulness on percussion over the part complained of, but no marked physical signs of inflammatory mischief. On Oct. 19th, the patient was worse. The pain in the left chest was more severe, resembling that of pleurisy; the pulse was full and frequent; the tongue brown, and rather dry; there was very little cough and no expectoration. On percussion, the right side was very dull over the lower lobe, less so over the upper lobe. The respiratory murmurs were nearly if not quite normal, over the whole of the right lung. Examination by auscultation unsatisfactory, on account of the turbulent action of the heart, and the catching character of the respiration. There were no cephalic or nervous symptoms. On Oct. 20th, the patient appeared more comfortable in the early part of the day, the respiration less laboured, and the pulse more quiet, and the tongue more moist; towards the latter part of the day, however, the symptoms increased in severity. Great dulness over whole of left side of chest was noticed, and greatly diminished resonance on the right side. The vesicular murmur was heard over a small portion of the superior lobe of the left lung only. Moist friction sounds over nearly the whole of the left lung could be heard, together with bronchial respiration, and, at some circumscribed parts, a very coarse crepitation. On the right side the vesicular murmur was rather faint, and greatly obscured by bronchial respiration. On Oct. 21st, there was less pain and dyspnoea, very little cough, with a soft infrequent pulse, pale countenance, and increasing dulness on percussion over the right side. Towards the latter part of the day there was less drowsiness. The patient died at $8\frac{1}{2}$ o'clock, on Oct. 22d. He was perfectly sensible and rational within ten minutes of his death. A *post-mortem* examination was made three hours afterwards. Cadaveric rigidity was strongly marked: the skin of the chest and face was of a deeply jaundiced hue. On making an opening into the chest, about twenty ounces of yellow serum were found in the left pleura, none in the right. The pleural cavities of both sides, but particularly the left, were covered to a considerable extent with coagulable lymph of considerable firmness. The left costal and pulmonary pleuræ were bound strongly together by broad, thick bands, the result of some former disease. There were also a few much less firm attachments on the right side. The

lower lobe of the left lung was in a state of gray hepatization, the upper lobe in that of red hepatization, and in both, at various points, were found circumscribed deposits of pus, containing from one-half a drachm to a drachm each. The lower lobe of the right lung was in a state of red hepatization, and the middle and upper lobes were greatly congested. In the lower lobe were found two or three purulent deposits, which appeared to form centres of inflammation, or metastatic foci. The wound along the scalp appeared as during life. Pus was found along the coronal and sagittal sutures, throughout the whole extent, dissecting the scalp from the bone to the breadth of one inch. The skull was roughened, and deprived of pericranium to that extent. The portion of the bone which had originally been denuded had begun to exfoliate, a line of separation being visible around it. On removing the calvaria, a thin layer of pus was found between the bone and dura mater, extending along the sagittal and coronal sutures to the same extent as on the external surface, the amount of pus within the skull being less than one drachm. There was a narrow strip of the dura mater each side of these sutures which was inflamed; at other parts this membrane was healthy. The arachnoid and pia mater were perfectly normal. The brain and its ventricles, the cerebellum, medulla oblongata, and roots of all the cerebral nerves, were carefully examined, and no lesions were discovered. The heart and its valves, the vena cava, and azygos, the pulmonary veins and arteries, the jugulars, and the bloodvessels of the brain, were in a normal condition. The liver was apparently healthy.

Comments.—This man died of acute pyæmia resulting from gunshot contusion of the cranial vault, four days after the appearance of that disorder, and twenty-two days after his wound was inflicted. The foregoing report of his case is very interesting and instructive; it is also very complete in every essential particular, excepting two or three, namely, the anatomical appearances which the bruised portion of the skull itself presented on examination after death, and the condition of the veins of the diploë proceeding from the injured part in respect to their containing coagula, etc. The bruised portion of skull is described as being three inches long and one inch wide, as being denuded of pericranium and bathed in pus exteriorly, as being denuded of dura mater and bathed in pus interiorly, also as being roughened exteriorly, and in a state of incipient necrosis. The condition of the diploë, however, was not inquired into, probably because this part of the examination was inadvertently overlooked. The site of the contusion was high up on the cranial vault, and therefore it was not crossed by the incision made with the saw for the purpose of taking off the skull-cap. A special incision should have been made into the bruised portion of cranium for the purpose of exposing its interior to view. We know, however, from what has been found in strictly analogous cases, that the medullary tissue belonging to the injured part was also involved in suppurative inflammation, and that the cancelli of the diploë were filled with purulent matter. Both the outer and inner table could not have been simultaneously involved in destructive inflammation, as they were in this case, without there being also suppurative inflamma-

tion in the corresponding portion of diploë. As happened in the last five cases, so also in this instance, the stroke of the missile on the skull most probably aroused inflammation of a suppurative character in the medullary tissue underneath the place of impact, which afterwards spread from that tissue to the adjoining tables of the skull.

Prerequisite to the occurrence of pyæmia in any case whatever, is the existence of some local suppuration or some collection of purulent matter; for pyæmia never presents itself as an idiopathic or primary affection, but always as the sequel of some local suppurative inflammation, traumatic in respect to origin, with some very rare exceptions. But traumatic pyæmia is met with much more frequently when certain tissues are wounded than it is when other tissues are the seat of injury. Thus, every surgeon who had much to do with the treatment of wounds and operations in the late war must have noticed how seldom traumatic pyæmia supervened unless the bone was injured. Indeed, I have heard it stated by surgeons of large experience in our military hospitals, that they had never seen a case of traumatic pyæmia which was unconnected with lesion of the osseous tissue. This fact alone shows that in a very large majority of instances traumatic pyæmia results from injury of bone. On this point Mr. Simon says: "Not all surgical patients having wounds have an equal or nearly an equal liability to it. It shows an almost infinite preference for cases where bone structure (particularly cancellous bone structure) has been injured, as in compound fracture or in the surgical procedures of amputation and resection, and all the more, perhaps, in proportion as the injured bone is large." (*Sixth Report of Medical Officer to Privy Council*, p. 61.) We therefore have good reason to believe that, in the case just related, pyæmia resulted from injury, in the form of contusion, of the diploë, and that the local suppurative inflammation from which it directly sprung had its seat in the soft medullary tissue of the diploë, *i. e.*, it was in reality cranial osteo-myelitis of a suppurative character, the product of gunshot contusion of the skull which led to the occurrence of pyæmia in this case.

Perhaps the site of the contused and inflamed portion of skull aided somewhat in the production of pyæmia in the foregoing case, inasmuch as it lay directly over and along the course of the superior longitudinal sinus. It is but fair to suppose that absorption of the pyæmic poison would occur rather more readily from a purulent collection situated in close relation to the great venous canals of the dura mater than it would from a purulent collection situated at some distance away. Moreover, it is not improbable that if the veins of the diploë had been examined at the autopsy, some of those connected with the contused portion of cranium would have been found to be filled with blood clots undergoing puriform transformation, or, in other words, undergoing the process of thrombosis, and thus furnishing the venous emboli which produced pulmonary infarction, etc. The absence of cough, notwithstanding the severity and extent of the secondary

lesion of the lungs, and the hebetude, which were noted in this case, the writer has also observed in many similar cases of acute traumatic pyæmia.

The reports published in the *Medical and Surgical History of the War of the Rebellion*, Part First, vol. ii. pp. 84, 85, "specify five cases of gunshot wounds of the scalp in which pyæmia supervened." One of these five cases was that which has just been related, and which was obviously an example of gunshot contusion of the skull. There is also good reason to believe that the other four cases were, in reality, examples of gunshot contusions of the cranium instead of uncomplicated gunshot wounds of the scalp, and there is nothing in the published account of them which disproves the correctness of this opinion. Indeed, whenever pyæmia presents itself as a sequel to seemingly uncomplicated wounds of the scalp, there is good reason, at least to suspect, that the underlying bone has also been injured, and that its medullary tissue is undergoing suppurative inflammation, whereby it becomes the fountain from which the pyæmic phenomena flow.

The next case belongs to the same category as the last. In it also gunshot contusion of the skull led to the occurrence of pyæmia in an acute form, which resulted in death.

CASE XIX.—G. Brower, sergeant, Co. F, 16th Ohio Vols., received at the siege of Vicksburg, Miss., December 28, 1862, a gunshot wound of the scalp, in the right occipital region, with contusion of the bone. He was conveyed to Padueah, Ky., on the hospital steamer City of Memphis, and admitted on January 13th into the St. Mark's Hospital. There was paralysis of the left leg: pyæmia supervened, and death took place February 21, 1863. (*Loc. cit.*, p. 122.)

CASE XX. *Chronic Pyæmia resulting from Gunshot Contusion of Right Parietal Bone; Death forty-five days after the Wound was inflicted; Autopsy; Injured portion of Bone extensively denuded, porous, and spongy; Meninges very much thickened and blackened.*—Thomas Kennedy, private, Co. M, 1st Mass. Heavy Artillery, aged 30, was wounded at Petersburg, Va., June 16, 1864, by a conoidal-pistol ball, which contused the right parietal bone near the descending branch of the lambdoidal suture. On the 21st he was admitted to the Lincoln Hospital at Washington. Simple dressings were applied, as the injury was considered slight. On July 16th he was furloughed, but he returned on the 29th, stating that while absent he had suffered from ague, and, for the last ten days had had a chill daily. A careful examination of the wound was now made, and a roughness of the external table of the skull was detected. He was much prostrated, but complained of no pain or uneasiness about the head. His pulse was frequent and feeble, tongue dry and red, and the abdomen tympanitic and painful. Three grains of calomel with one-fourth of a grain of opium were ordered every three hours, until the third dose had been taken; meantime tonics and stimulants were given, and afterwards continued in liberal doses. Sinapisms were applied to the epigastrium and extremities. No perceptible improvement, however, was obtained. He died on the afternoon of the 31st, remaining fully sensible, and able to answer questions intelligently until within two or three hours of death.

At the *autopsy* the seat of injury was found to be near the middle of the posterior edge of the right parietal bone. The missile had glanced downward and forward, and was found lying against the skull, two inches from the point of injury. The periosteum was separated a distance of three and three-quarter inches along the track of the missile; the denuded bone was porous and spongy. The line of separation from healthy bone was well marked. Upon removing the skullcap a slight sponginess of the internal table beneath the point of impact was observed. The meninges, for some distance around the seat of injury, were very much thickened and blackened, and firmly adherent to the calvaria. The brain-substance was softened, and the vessels very much congested. The heart, liver, and spleen were flabby. (*Loc. cit.*, p. 111.)

Comments.—The diagnosis of chronic pyæmia in this case is founded mainly on the symptoms which were observed during life, interpreted of course by the lesions which were revealed at the autopsy. They clearly show that death did not result directly from inflammation of the bruised portion of skull, nor from inflammation of the membranes of the brain, nor from inflammation of the substance of the brain. The cerebral softening found at the autopsy was not the red or inflammatory kind of softening, but appears to have resulted from impaired nutrition, and to have been brought about in the same way as the flabby condition of the heart, the liver, and the spleen, that were also found at the autopsy. The congestion of the cerebral veins was probably due to the mode of death. Moreover, the morbid state of the heart, liver, spleen, and brain, just described, denotes that the disease which killed this patient had also greatly impaired the nourishing qualities of the blood, *i. e.*, it had made important changes in the composition of the blood, and was therefore a general or constitutional disease most probably of zymotic origin. It was not typhoid fever, because neither the phenomena during life nor the *post-mortem* lesions which characterize that disease were found. It was not ague, nor intermittent, nor remittent paludal fever, because in these days of the liberal use of quinia paludal fevers do not destroy life in the way this man's life was destroyed; and the enlarged spleen and bronzed liver of malarial disease also were not present. This man, then, must have died of septic blood-poisoning in the form of pyæmia, which ran a chronic course, for he survived the pyæmic invasion twelve days. The pyæmic poison got into the general circulation by absorption from the suppurating diploë of the injured portion of skull. His chills were not malarial but pyæmic, in respect to causation. Moreover, pyæmic rigors have not unfrequently been observed to present themselves with considerable regularity, as they did in this case, and thus have readily been mistaken for malarial rigors. The rapidly increasing debility, the great prostration of strength, the frequent and feeble pulse, the dry tongue, the tympanitic and tender belly, associated with but little if any disturbance of the intellect, until death is near, form a combination of symptoms often witnessed in cases of pyæmia; but in no other disorder. The absence, however, of secondary

abscesses of the lungs, liver, etc., is noteworthy; but this is to be said concerning it, namely, that such abscesses are not present in those cases of undoubted pyæmia which eventuate in recovery, and that the formation of such secondary abscesses is not essential to the constitution of the disease. Of fifty-nine cases of undoubted pyæmia treated in the Stanton Military General Hospital during the year ending Sept. 30, 1864, under the writer's direction, fifty-six died and three recovered. Moreover, secondary abscesses in the lungs, liver, etc., are sometimes wanting in those cases of pyæmia where large metastatic abscesses form among the muscles of the extremities.

In regard to the frequency with which pyæmia proves to be the proximate cause of death in cases of gunshot contusion of the cranial bones, theoretical considerations would lead to the belief that purulent infection would be common in gunshot contusions of the skull, in consequence of the entrance of the pyemic contagium into the veins of the diploë, but the surgical reports of the late war do not sustain the supposition, and present not more than half a dozen cases belonging to this category among the fifty-five deaths which occurred in three hundred and twenty-eight patients with gunshot contusions of the cranial bones whose cases were reported. Pyæmia, however, presents itself with sufficient frequency among the consequences of cranial contusions, and that too in a fatal form, as to make it the duty of the surgeon to do everything he can to prevent its occurrence.

3. Inflammatory Necrosis with Exfoliation, and Caries, as results of Cranial Contusion.—Necrotic osteitis attended with exfoliation of the dead piece of bone very often results from contusion of the cranial bones, in cases where, for various reasons, it cannot be satisfactorily determined whether the osteitis itself is a primary affection, or whether it is a secondary affection, and has been induced by traumatic inflammation of the medullary tissue of the diploë, on the one hand, or by traumatic inflammation of the periosteum on the other. These cases of traumatic osteitis, then, whose causal relations and real character are vague and undetermined, we propose to group together under the head of inflammatory necrosis, a term which defines sufficiently well the nature of its origin without attempting to state whether the osseous inflammation has resulted from cranial osteo-myelitis, or from cranial periostitis, or whether it is a primary affection of the bone-tissue itself. But primary osteitis in an acute form, by which is meant acute inflammation commencing in the bone-cells and calcified intercellular substance of the osseous tissue, is a disease which is but very rarely met with; while acute medullitis and periostitis, but especially the former, not unfrequently present themselves as primary disorders, resulting from injury. Nor are we surprised at this comparative rarity of acute primary osteitis, when we remember how exceedingly vascular and rich in cell-structures the medullary tissue is; while the osseous

tissue proper is among the least vascular of all the tissues of the body, and at the same time is but scantily supplied with corpuscular elements. Ollier, who is very high authority on this subject, says: "Inflammation does not affect the bone-cells proper, except secondarily; its first effects are produced upon the marrow-cells, the osteogenetic layer of the periosteum, and the contents of the Haversian canals." (*American Journal of the Medical Sciences*, January, 1868, p. 152.) However, putting to one side the question as to whether traumatic ostitis ever presents itself as a primary disorder of bone, it is certain that it very often presents itself as a secondary disorder, having for its proximate cause inflammation of the medullary tissue or of the periosteum; and, as a secondary disorder of contused bone, it may run an acute, a subacute, or a chronic course. In the acute and subacute forms of traumatic ostitis suppuration is present, and necrosis of the injured portion of bone is very apt to occur from stoppage of the circulation of blood therein through mechanical pressure exerted by the products of the inflammation, especially by the repeated division and multiplication of the cells thereof upon the capillaries within the unyielding walls of the Haversian canals, etc. Thus the inflow of nutrient blood and of nutrient *materiel* in every form is arrested, and the affected portion of bone perishes, or becomes necrosed, in consequence of such stoppage of nutrition. After some time the dead bone gets separated from the living or sequestered by demarcation or fungating ostitis; and ultimately, in favourable cases, it may be expelled as an exfoliation or a sequestrum. As soon, however, as the necrosed bone is detached from the living it is usually extracted by the surgeon's art.

The next three cases are examples of inflammatory necrosis and exfoliation of parts of the cranium, occurring in consequence of gunshot contusions of the skull.

CASE XXI.—Benjamin Stafford, private, Co. I, 26th N. Y. Vols., was admitted to the Fairfax Seminary Hospital, Sept. 29, 1862, with a gunshot wound over the right side of the frontal bone, received at Antietam, on Sept. 17th. He was returned to duty May 8th, 1863. It was found, however, that the outer table of the os frontis was exfoliating, and the man was discharged from the service on May 28, 1863. He was examined at Utica, N. Y., for a pension, by Dr. H. B. Day, April 22, 1864. It was found that two fragments of bone had exfoliated, and that there was a fistulous sinus through which detached bone could still be felt. (*Loc. cit.*, p. 104.)

CASE XXII.—James H. G., private, Co. A, 90th Penna. Vols. Supposed gunshot scalp-wound over occipital, Antietam, Sept. 17, 1862. Entered hospital at Washington, Sept. 23d. Transferred to Fort Schuyler's Hospital, N. Y., October 7th. Transferred to Fort Hamilton, Dec. 1st. On Dec. 13th, he entered the Satterlee Hospital, Philadelphia, complaining of pain in the occipital region. The wound was closed, but it reopened on Dec. 18th. On January 18, 1863, a circular portion of dead bone, an inch in diameter, was detected by a probe. The patient had no pain or derangement of the mental faculties, and walked actively about

the ward. About Feb. 2d, the discharge from the wound was profuse, and the necrosed bone had not separated. There was no change in his condition until Feb. 25th, when the exfoliation was observed to be loose, and it was extracted through a crucial incision. The exfoliation consisted of a portion of the external table, an inch in diameter, and several smaller pieces. On March 3d yet another piece of the external table was removed. On March 17th the wound was nearly healed. The patient felt entirely well, and on May 22, 1863, he was discharged from the service. He appears to have had no subsequent trouble, since his name does not appear on the list of applicants for pensions. (*Loc. cit.*, p. 103.)

CASE XXIII.—Francis W. Gilkey, Co. K, 10th Penna. Reserves, was wounded in one of the earlier battles of the war, and made a prisoner. In January, 1863, he was exchanged, and received at the Annapolis General Hospital. He had to the right of the vertex a large ulcer, resulting from a gunshot wound of the scalp, extending over the sagittal suture. The skull was necrosed, and probably there had been denudation, with contusion of the bone. Erysipelas supervened, followed by gangrene. When this was arrested exfoliation took place, and the brain was exposed. A necrosed fragment of the parietals, irregularly triangular in shape, two inches long by one inch wide, and embracing both tables, was removed. Granulations sprang up, the wound closed, and the patient recovered without any further complications. He was discharged from the service on January 29, 1863. His name does not appear on the pension roll. The specimen is preserved in the Army Medical Museum. A figure of it is given in the *Medical and Surgical History of the War*, Part First, vol. ii. p. 105.

Comments.—The last case is chiefly remarkable for the large size of the exfoliated piece of bone. It was two inches long by one inch wide, and embraced both tables of the skull. If it were profitable so to do many additional examples of inflammatory necrosis and exfoliation of the cranial bones resulting from gunshot contusion might be adduced from the *Medical and Surgical History of the War of the Rebellion*; since exfoliation was frequently observed in gunshot contusions of the skull, and many examples of it are noticed in the categories of other complications.

With regard to *Caries* as a result of contusions of the cranial bones, the experience of our civil war shows that it but seldom occurs, inasmuch as it was met with in but four of the reported cases. Dr. Otis, the accomplished surgical historiographer, says: “Gunshot contusions of the cranial bones were succeeded, in three instances, by caries. This complication, common enough in tertiary syphilis, mercurio-syphilis, and scrofula, rarely occurs as a result of injury, unless there is some constitutional taint. There is no evidence, however, that any such vice of system existed in the cases of which abstracts are subjoined. The energetic treatment advised by authors, such as applications of the rugine or trepan, the actual cautery, or chloride of zinc, red oxide of mercury, and other potent escharotics were not employed in any of these cases.” (*Loc. cit.*, p. 106.)

Next we present a brief account of one of these cases.

CASE XXIV.—Wm. Price, Co. H, 8th Tennessee Infantry, aged 39, received in the engagement near Atlanta, Ga., Aug. 8, 1864, a slight injury of the left parietal bone, and also a flesh wound of the leg. He was taken to the field hospital of the 23d Corps, and on Aug. 15th was admitted to the Asylum Hospital, Knoxville, Tenn. No account of his treatment is recorded. He was discharged from the service on June 20, 1865, and pensioned from that date. On March 1, 1869, pension examining surgeon, R. P. Mitchell, reports that this man was living at Rogersville, Hawkins Co., Tenn.; that he had caries of the skull, bits of bone passing out in the purulent discharge. The wound was still open and suppurating five years subsequent to the injury, and the man was utterly unable to perform manual labour, or to bear exposure to the sun's rays. (*Loc. cit.*, p. 106.)

4. *Inflammation of the Pericranium as a consequence of Contusions of the Skull.*—The experience of our army surgeons during the late war of the rebellion has abundantly shown that cranial periostitis should not be classed among those consequences of cranial contusion which are frequently met with; for protracted inflammation of the bruised pericranium was observed in only a few instances, from the beginning to the end of the conflict. Thus in the *Medical and Surgical History of the War* out of three hundred and twenty-eight cases of gunshot contusions of the cranial bones, only four examples of periostitis of the skull are reported; and not a single instance is given wherein the osteogenetic layer of the pericranium was roused to functional activity by inflammatory excitement, so as to form new laminae of osseous tissue. Moreover, Dr. Otis states that he has carefully examined more than forty crania, contused by gunshot projectiles, without finding even one example of the local hyperostosis of the skull which would have resulted from inflammation of the pericranium, had it really been present. (*Loc. cit.*, p. 127.)

The following is one of the few instances of cranial periostitis that were reported:—

CASE XXV.—Charles Harriek, private, Co. D, 94th N. Y. Vols., aged 25, received at Gettysburg, July 3, 1863, a contusion of the right parietal bone at the lower posterior angle, by a conoidal musket-ball, which lodged under the integuments. He was admitted to Satterlee Hospital, Philadelphia, on July 10th, and on the following day the position of the ball was detected by a probe, and the missile was extracted. A slight scale of the outer table necrosed, and the *pericranium was inflamed for a while*; but the wound ultimately did well, and the soldier was returned to duty Dec. 3, 1863. (*Loc. cit.*, p. 102.) His name is not found on the pension list.

Comments.—This example of cranial periostitis occasioned by the impact of a conoidal musket-ball and the irritation due to its remaining in contact with the torn and bruised pericranium, one whole week, before its extraction, serves well to illustrate the kind of inflammation that is kindled in the pericranial membrane of healthy subjects, when badly injured by the impact of, and afterward irritated by contact with, gunshot mis-

siles. Moderate suppuration, and the exfoliation of a slight scale of the outer table occur, then the wound heals, and afterwards the cure remains complete, which is proved by the fact that the man never applies for a pension. And this, too, is all that happens in an exceptionally bad case of traumatic inflammation of the pericranium; for, in the great mass of strictly analogous cases of gunshot contusion of the head, the pericranium gives no trouble whatever.

This example of cranial peritonitis, occasioned by contusion, also shows how small the destructive power really is, which traumatic inflammation of the pericranium can exert upon the contiguous table of the skull. And we are not surprised to find it so, when we consider how small a share the pericranium has in supplying the blood which nourishes the cranial bones; for the skull receives almost all its nutrient blood from vessels which run along the grooves between the dura mater and the inner table, or pass through the tunnel-like canals in the spongy structure of the diploë. The portion which it receives from the vessels of the pericranium is relatively very small. Even the external table gets almost all its nourishment from the walls of the diploë. Hence, it happens that the pericranium can be extensively torn off from the skull, and can be otherwise widely destroyed, by violence or by disease, without the occurrence of any corresponding lesion whatever of the denuded bone. The writer has seen a considerable number of cases wherein some bone was extensively deprived of periosteum, and yet no caries, nor necrosis, nor any morbid change whatever took place. The bones in which he has seen this occurrence were those of the cranium, the face, the thigh, and the leg. T. Holmes bears concurrent testimony. He says: "It is true that large separations, and even extensive destructions, of the periosteum may occur without the death of any portion of the bone, and this is indeed common in the bones of the head and face; but the peculiar circulation in the former, and the great vascularity of all parts in the latter region sufficiently explain this fact." (*System of Surgery*, vol. iii. p. 762.) The following case bears considerable resemblance to the last in several important particulars:—

CASE XXVI.—George D. King, private, Co. I, 21st Mich. Vols., was wounded at the battle of Stone River, Dec. 31, 1862, by a musket ball, which struck behind the left ear and lodged under the scalp, lying against the bone. He was sent to Hospital No. 7, Louisville, Ky. On January 15, 1863, erysipelas supervened. He gradually recovered, and, on April 15th, he was transferred to Hospital No. 19. On the 27th, he was readmitted to Hospital No. 7. Four months after the reception of the injury the ball was extracted. The sense of hearing was entirely destroyed. He was discharged from the service for disability, rated at one-half, on May 16, 1863. A year subsequently, pension-examining surgeon Geo. W. Mears reports that the wound was still discharging slightly. There was probably a scale of the outer table detached. (*Loc. cit.*, pp. 101, 102.)

Comments.—This man received a gunshot contusion of the skull; and the musket ball which occasioned it remained unextracted for a period of

four months. It is not improbable that cranial periostitis of a pretty severe character occurred in consequence thereof. Fifteen days after the wound was inflicted erysipelas supervened. It is also not improbable that the pericranial inflammation had a good deal to do in causing the erysipe latous inflammation. It is worthy of special remark in this connection, that *no case of diffuse inflammation of the pericranium was reported during the whole course of the war.*

5. *Meningitis and Encephalitis as consequences of Contusions of the Cranial Bones.*—These formidable disorders were the most common of all the proximate causes of death after gunshot contusions of the cranium, during the late civil war. Out of 328 cases of that form of injury which were reported, 55 patients died; and, in 32, or considerably more than one-half of the fatal cases, "various secondary lesions"—of the brain and its membranes, inflammatory in their nature, were the proximate causes of death. (*Med. and Surg. Hist. of the War of the Rebellion*, Part First, vol. ii. p. 126.) These truly formidable disorders, then, must be ranked among the most important of all the consequences with which gunshot contusions of the skull are attended. Now, we have already presented a considerable number of cases wherein contusions of the skull proved fatal through the spreading of the inflammatory process from the bruised portion of skull to the contiguous membranes and substance of the brain. For the purpose of impressing the reader still more strongly with the great frequency, variety, and importance of this complication, the following examples are added.

CASE XXVII. *Gunshot Contusion of Frontal Bone; Necrotic Ostitis supervened; Meningitis followed; Death twenty-seven days after the wounding; Autopsy.*—Private A. H. Cutting, Co. K, 13th Massachusetts Vols., was wounded at the battle of Gettysburg July 3, 1863, by a conoidal musket-ball, which caused a contusion of the frontal bone, just above and external to the right frontal eminence. He was admitted to Camp Letterman, and thence was sent to the McDougall Hospital, at New York, on July 12th. Meningitis supervened and death ensued, on July 30th, twenty-seven days from the reception of the injury. The osteological specimen is preserved in the Army Medical Museum, at Washington. The injured part of the external table is porous and spongy, and a small scale of bone was evidently in process of exfoliation. The internal table shows no trace of injury beyond the most trivial discoloration. (*Loc. cit.*, pp. 110, 111.) In this case the gunshot contusion obviously gave rise to necrotic ostitis of the bruised part of the frontal bone, which, in turn, occasioned meningitis that proved fatal.

The following is an example of secondary meningo-cerebritis the result of cranial contusion and inflammation, wherein trephining was resorted to but without success.

CASE XXVIII.—Private S. D. Chapman, Co. H, 92d Ohio Volunteers, received at the battle of Chickamauga, Sept. 23, 1863, a gunshot wound of the scalp, near the upper posterior angle of the right parietal, with contusion of the bone. He was sent to Nashville, and admitted to Cumber-

land Hospital, on the 25th. The wound produced little inconvenience until October 4th, when grave head symptoms, such as delirium and convulsions, supervened. There was hemiplegia also. On Oct. 5th, the patient was comatose, and trephining was resorted to. When the skull was perforated, exit was given to a quantity of pus, which had formed between the dura mater and cranium. Consciousness was restored almost immediately, and apparent steady improvement for the next twenty-four hours; but symptoms of compression then recurred, and the patient died on Oct. 9th, sixteen days after the wound was inflicted. At the *autopsy* the right hemisphere was found partially disorganized, and covered with a layer of pus which extended to the longitudinal fissure. (*Ibid.*, p. 124.)

The next case is an example of secondary meningitis and abscess of cerebellum, the result of cranial contusion and inflammation; trephining was also resorted to without success.

CASE XXIX.—Benjamin F. Chappel, sergeant, Co. H, 8th N. Y. Cavalry, aged 27, was wounded before Petersburg, Va., April 1st, 1865, by a pistol ball which entered one inch above and one and a half inches to the left of the occipital protuberance, and emerged just below it on the opposite side, denuding the bone of pericranium. He was admitted to the 3d division hospital of the Cavalry Corps, and, on the 3d, was sent to Washington, where he entered Harewood Hospital on the 5th. Until the 14th, the patient seemed to be improving, but on that day a slight hemorrhage from the occipital artery occurred, causing the loss of about six ounces of arterial blood. The hemorrhage was arrested by compression, and the case apparently progressed favourably. On the evening of the 18th, the patient, however, complained of considerable pain in the region of the cerebellum. On the following day considerable gastric irritation manifested itself, and, at intervals, there was slight delirium. Ether was administered, an incision two and a half inches in length was made, just below and parallel to the lambdoidal suture, the scalp was retracted, the trephine applied, and a disk of bone removed, giving exit to a quantity of pus. The patient reacted promptly after the operation, and seemed to be much relieved, but in the evening he began to sink, and died on the morning of April 21st, twenty days after the wound was inflicted. The *autopsy* revealed a large abscess in the left lobe of the cerebellum, which contained four or five ounces of pus. The medulla oblongata was implicated. The osteological specimen is preserved in the Army Medical Museum at Washington. The bruised portion of bone is slightly discoloured and cribiform (*Ibid.*, pp. 124, 125), *i. e.*, it exhibits the traces of osseous inflammation.

But in one of the instances of cranial contusion from gunshot related above (see Case XIV.) where the trephine was also applied to relieve the symptoms of cerebral compression no pus was found between the skull and dura mater, and no signs whatever of secondary meningitis. There was, however, a large abscess in the left cerebral hemisphere, whose contents were discharged by puncturing the brain-substance through the trephine-hole with a bistoury. This abscess, obviously, was not produced by spreading of the inflammatory process from the bruised skull to the membranes and substance of the brain. It was doubtless due to injury of the brain-tissue itself in the form of concussion, commotion, or contusion thereof, produced by the

same blow that bruised the skull. The cerebral abscess, and the inflammatory necrosis were independent affections which simultaneously resulted from the operation of the same cause. In another case belonging to the category of gunshot contusions of the skull, that of Col. Farnham (*loc. cit.*, pp. 109, 110) the stroke of the missile upon the left parietal contused the pia mater and brain-substance, with ecchymosis thereof, beneath the place of impact, and thus led to the formation of a cerebral abscess, while there were no evidences of inflammatory disorder in the cranial walls; and it often happens in cases of cranial contusion that the patient suffers much more from the mechanical injury which the brain-substance sustains thereby, than from the bruising of the bone.

To the last-named category, *i. e.*, to concurrent injury of the brain, rather than to injury of the skull, belong the numerous cases of *persistent headache, vertigo, disordered vision, deafness, chronic irritability of the brain, epilepsy, aphasia, paralysis, and mental aberration*, which were observed in the persons of those who sustained gunshot contusions of the cranium during the late civil war, amounting in all to 104, out of 328 reported cases of that form of injury. (*Loc. cit.*, pp. 113-121.)

Treatment of Contusions of the Cranial Bones.—The plan of treatment which should be followed in cases of injury of the head, when there is reason to believe that the skull is bruised, whether it be from the stroke of bullets, or from blows or kicks or falls on the head, or from any other cause whatever, requires first of all the procurement of corporal and mental rest as nearly absolute as practicable under the circumstances which surround the patient. He should be confined to bed in a sitting or semi-recumbent posture with his head comfortably supported in this elevated position, and all noises or loud sounds, and other cerebral excitants of every kind, should be carefully excluded; in short, everything that is possible should be done to secure quietude of the body as a whole, and quietude of the brain, since *rest* is Nature's almost universal remedy.

The following example illustrates some of the bad effects of inattention to this most important precept:—

CASE XXX.—Charles K. Baker, private, Co. D, 27th Mass. Vols., aged 25, was wounded at the battle of Newberne, N. C., March 14, 1862, by a conoidal musket-ball, which made a long furrowed wound of the right parietal region, lacerating the scalp and denuding the pericranium. He was treated at a field hospital by his regimental surgeon. The right side of the head was shaven, and a compress dipped in cold water was secured over the wound by a bandage. The patient was required to keep his bed in the log hut used as an hospital, and to observe a strict diet. He had no headache, nor any symptom of disturbance of the brain. Careful exploration revealed no injury of the bone. On March 20th the wound was fairly cicatrizing, and the patient was sent on an hospital transport up the Neuse River to the Carver Street Hospital at Newberne, five miles distant. Two days subsequently, through the inadvertence of an hospital steward, this man's name was placed in the list of wounded to be sent

northward on the hospital steamer New York. Surgeon J. B. Upham, in charge thereof, reports that he had no cerebral symptoms on the passage. He proceeded to his home in Amherst, Mass. On April 3d he complained of headache, and on the next day symptoms of compression of the brain appeared. On April 7th he was trephined, and died a few hours after the operation. (*Loc. cit.*, p. 124.)

No doubt this man's chances of recovery were greatly lessened by removing him from the hospital wherein he was first placed; and we may with propriety here remark in a general way, that the practice of transferring patients belonging to this category from hospital to hospital, prior to recovery, which obtained during our war of the Rebellion, as shown by the record of many cases related in the foregoing pages, was highly detrimental to most of these patients, and, in all probability, occasioned the loss of some lives which might otherwise have been saved.

Besides rest of body and mind, the patient's diet should be rather spare, and restricted to articles that are nutritious and of easy digestion, but not stimulating in their nature.

The ice-bag should be applied to the bruised part for the purpose of keeping down the inflammatory process therein; *i. e.*, in order to prevent its becoming suppurative and necrotic, on the one hand, and to protect the membranes and substances of the brain from its invasion, on the other. The ice-bag should be constantly kept on the injured part, both day and night, until all danger has been passed; and compresses should be interposed between the ice-bag and the scalp of sufficient thickness to prevent discomfort. In cases where pyrexia, headache, and other symptoms of meningo-cerebral inflammation appear, aconite in full doses and mercurial purges can be administered with advantage; and in sthenic cases blood can be drawn locally by leeches or cups, with decided benefit. Symptoms of cerebral compression, when due to the exudation of serum, can be combated by blistering the neck, by hydragogue cathartics, and by exhibiting potassium iodide in ten-grain doses every four hours. But for the purpose of controlling cerebral inflammation, the judicious and methodical application of the ice-bag to the head is of more value than all the other remedies put together. Such, at least, is the lesson which my own experience has taught.

When erysipelas of the scalp supervenes, it should be treated with a strong solution of sodium sulphite externally, and with liberal doses of the sesquichloride of iron and muriate of quinia internally; in bad cases a liberal use of alcoholics should also be made. Fortunately, this complication is of very infrequent occurrence, for but six cases of it are reported among the 328 patients having gunshot contusions of the cranial bones that were observed during our war of the Rebellion (*loc. cit.*, p. 101). When abscesses form beneath the scalp, their contents should be withdrawn at an early period by suitable incisions, followed by poultices. Large cuts should not be made when smaller ones will answer the pur-

pose, because of the vascularity of the scalp and the risk of hemorrhage. The "puffy tumour" of Pott should also be opened at an early period. Concerning this kind of swelling, that sagacious observer remarks: "The inflammation of the dura mater and the formation of matter between it and the skull, in consequence of contusion, is generally indicated and preceded by one [symptom] which I have hardly ever known to fail. I mean a puffy, circumscribed, indolent tumour of the scalp and a spontaneous separation of the pericranium from the skull under such tumour." (Pott's *Chirurg. Works*, vol. i. p. 56.) The surgical history of our war of the Rebellion, however, shows that this form of abscess is by no means of frequent occurrence, since it presented itself in but few of the 328 cases above mentioned. Exfoliations and sequestra should always be extracted as soon as they are completely detached.

Trephining in cases of cranial contusion for intra-cranial abscess was, in Pott's hands, a very successful operation, for by this means he saved five out of eight cases (*op. cit.*, pp. 63-107). But no such success has attended the practice of other surgeons. During our war of the Rebellion, trephining was resorted to for cerebral compression in twelve cases of gunshot contusions of the skull, but without success in every instance. In five of them pus was found between the skull and dura mater, in one case beneath the dura mater, and in two cases in the substance of the brain. In two instances it is alleged that intra-cranial extravasation of blood was found; in four that extensive arachnitis and meningitis were present; in four cases, however, the causes of the symptoms of cerebral compression were not specified (*loc. cit.*, pp. 123-126). Indeed, the successful issue of a case of trephining for intra-cranial abscess, the result of contusion of the skull, is almost unknown to the surgeons of the present day. And although this operation offers but small hope for the relief of cerebral compression when produced by purulent matter or other inflammatory products, the result of cranial contusion, it should not be entirely given up, since it affords the only chance left for saving such cases.

In very rare instances the purulent matter beneath the dura mater is walled in by plastic material in such a way that a perfectly circumscribed abscess is formed. In such instances, as soon as the skull is perforated the dura mater bulges into the trephine-hole; it is also tense and without pulsation. Here, there is no doubt as to what ought to be done. The dura mater should be punctured with a bistoury, and the matter evacuated. Thus, Guthrie saved one of his patients by incising the dura mater. (*Injuries of the Head*, p. 127.) In Roux's case, on withdrawing the trephine a large aperture was found in the dura mater, through which the contents of a circumscribed abscess within the cavity of the arachnoid rapidly escaped, and the patient recovered. (*Archiv. Général. de Méd.*, vol. xxiv. p. 268.) Mr. Dunville's case affords another striking instance of circumscribed suppuration beneath the dura mater, the result of cranial contusion.

The patient, a young girl, was admitted into the Manchester Royal Infirmary for a scalp-wound with denudation of the frontal bone. Three weeks after the injury, symptoms of cerebral compression appeared, and it was thought that a collection of matter had gathered between the dura mater and the skull at the seat of injury. Accordingly, the trephine was applied, but no pus was found on the dura mater. That membrane, however, was whiter and thicker than normal, excepting one point where there was a red spot, which proved to be a small aperture in the dura mater. Through it the flat end of a probe was passed, whereupon a quantity of most offensive pus spirted out. This patient also ultimately got well (*British Med. Journal*, 1858, vol. ii. p. 743). As a *dernier ressort*, then, we should not hesitate to employ the operation of trephining in those cases of contusion of the skull where the symptoms of cerebral compression present themselves in consequence of intra-cranial suppuration, for by so doing we may occasionally rescue a patient from otherwise inevitable death.

In all cases of cranial contusion where suppuration of the diploë occurs, Abernethy strongly recommends that the matter should be discharged, promptly, by trephining the outer table, or, in other words, that abscess of a cranial bone should be treated on the same plan as abscess of any other bone. He says :—

“ When matter is formed in the diploë, the pericranium will certainly separate from the bone, and the external table of the skull will undoubtedly perish. In a case so clearly marked, the conduct to be pursued is obvious, which is to remove a portion of the external table with the trephine, so as to discharge the matter collected in the diploë, without which no relief can be obtained. I have seen in several cases, where the operation was performed early, that the external table came away within the circle of the trephine, the matter was discharged from the medullary part of the bone, and the internal table remained sound and entire, covering the dura mater. Granulations soon arose, and the patients got well, with the exfoliation only of a portion of the outer table. The mischievous consequences of delaying the operation, when once the disease is known, must be evident; for the matter collected within the bone, having no outlet, will press on every side, first gradually destroying the diploë, sometimes extending itself over almost the whole of the cranium, and at last occasioning the partial absorption of both tables, so that the skull after death shall be found perforated with a number of holes, like a piece of worm-eaten wood. These holes afford a discharge to the matter, which not only oozes out beneath the pericranium, but also insinuates itself between the skull and dura mater; till at length the patient sinks, worn out by the irritation and fever which this painful and extensive disease creates, unless, as it sometimes happens, he is previously destroyed by inflammation attacking the membranes of the brain.” (*Surgical Observations*, vol. ii. pp. 68, 69, Am. ed. 1811.)

When, therefore, the surgeon finds on incising a “puffy” swelling, or any other swelling of the scalp, in a case of cranial contusion, that there is oozing of purulent matter from the external table of the skull, or when from any cause whatever he becomes satisfied that the diploë is suppurating, he should proceed without delay to expose the diseased bone by suitable incisions, and “to remove a portion of the external table with the tre-

phine, so as to discharge the matter collected in the diploë, without which no relief can be obtained." This operative procedure should be supplemented with antiseptic dressings; and there is good reason to believe that this plan of treatment, especially when begun at the outset of the suppuration, would be attended with most gratifying results.

46 WASHINGTON SQUARE, July 7, 1879.

ARTICLE VII.

TWO CASES OF CLONIC BLEPHAROSPASMUS AS TRAUMATIC REFLEX NEUROSES. By F. C. HOTZ, M.D., Ophthalmic Surgeon to Illinois Charitable Eye and Ear Infirmary, Chicago, Ill.

THE convulsive action of the orbicularis palpebrarum, which causes the morbid nictitation of the eyelids, is generally due to reflex irritation. It may be excited by the irritation of a foreign body upon the conjunctiva or cornea; it may be caused by acute inflammations of the cornea or conjunctiva; it may be occasioned by the abnormal strain of the organs of accommodation.¹ In some cases the nictitation cannot be accounted for by any local anomaly; but, then, we may find as a remote cause a disorder of the digestive or uterine functions, or an anaemic or debilitated state of the constitution. Still there remains a number of cases of blepharospasmus which, until recently, seemed inexplicable by any apparent cause and were regarded as the result of a bad habit.² People take very easily to this idea of a bad habit as an explanation of morbid phenomena, and adhere to it very tenaciously, even though it has long been discarded by the advanced experience of medical science. Some thirty years ago it was an universally accepted doctrine that a child could acquire convergent strabismus by habit, by imitating a cross-eyed child, or by looking steadily at a ribbon or a curl of hair dangling close in front of its eyes. Thanks to the classical works of Von Graefe, Donders, and others, this idea has been thoroughly dispelled from the minds of medical men. But we find it still firmly rooted in the minds of the laity; and it will probably take another quarter of a century, before, at least, the educated class of the people will have abandoned the old idea, and will understand that the development of strabismus depends upon conditions of the eyes on which the will of the child has no influence.

Again, children are often observed breathing with the mouth open; they are scolded and punished for what is supposed to be a bad habit, when a careful examination discloses an obstruction of their nasal passages, due

¹ See Chicago Med. Journal and Examiner, March, 1878.

² Mackenzie, Treatise on Diseases of the Eye, 1854.

to a chronic swelling and thickening of the mucous membrane of such degree that the poor children cannot get enough air through the nose and are forced to breathe through the mouth.

It is one of the many great merits which have rendered Von Graefe's name immortal, that he has illuminated the obscurity which enveloped the pathogeny of many cases of blepharospasmus. He was first to show that morbid nictitation without any plausible cause must be regarded as a true reflex neurosis, the primary seat of the irritation being in branches of the trigeminus, others than those distributed in the eyes and its appendages, or in other sensory nerves.¹ In the majority of such cases we can find in the course of the affected nerve a point which is often abnormally sensitive to pressure. And if we press upon these points, we succeed in diminishing or arresting the spasmody action of the orbicularis muscle. The supra-orbital and infra-orbital foramina are most frequently found to be such *pressure-points*. But more distant nerves also may be the seat of primary irritation. Von Graefe, for instance, could in one case arrest a violent blepharospasmus by pressure upon the arcus glosso-palatinus. In the most cases the history did not give any information in regard to the nature of the pathology of the nerves from which the reflex irritation was transmitted to the orbicularis palpebrarum. In a few cases (observed by MacKenzie), however, the sensory nerve had been wounded and was subsequently involved in cicatricial tissue. The excision of the scar arrested the blepharospasmus.

To these cases I can add the following two, which I trust are interesting enough to warrant their report.

CASE I.—Robert B—, aged 11, consulted me on Aug. 31, 1878. His mother stated that he was always considered a very nervous child, and that for a long time she had noticed a twitching of his eyelids, which, during the last year, had become worse; and that during the last six months his eyesight seemed to fail, and he could read only five minutes at a time, then the letters would become indistinct; he would get headache, feel dizzy and nauseated, and very often would vomit. Gazing attentively at any object produced the same effect. Sometimes these migraine-like attacks seemed to come upon him without any apparent provocation; he would get up in the morning feeling perfectly well, suddenly a severe pain starting from the back of the head would extend over the right side of his head, followed by obscuration of sight, nausea, dizziness and vomiting. These frequent attacks affected the nutrition of the boy by disturbing the digestion; he lost his appetite, looked pale, and showed deep bluish rings under the eyes. His physician was evidently puzzled by the trouble, and attributed the attacks sometimes to a weakness of the digestive power, at other times he thought the train of symptoms indicated congestion of the brain, and possibly some grave cerebral disorder.

As his eyes had lately given him much trouble, it was considered desirable to ascertain whether there was any serious trouble with them. The eyelids were in a continuous twitching motion, no matter whether

¹ Archiv f. Ophthalm., I., p. 440, and IV. p. 184.

the patient was looking at a near object or gazing inattentively in the distance. Lids, conjunctiva, cornea, and all other tunics of the eyeball were normal. Refraction slightly hypermetropic; H. m. $\frac{1}{3}\frac{1}{6}$; V = $\frac{2}{2}\frac{1}{6}$. But with or without + 36 he could read small print for a few moments only. This incapacity for near work, I thought, might be due to what is called accommodative asthenopia. Possibly a great amount of the power of accommodation might be expended to correct an error of refraction; there might be a certain degree of latent hypermetropia or masked astigmatism. Therefore, atropia (in 4 gr. solution) was instilled into each eye three times daily, for four days. After thus being thoroughly atropinized, the eyes, on Sept. 4, showed H. $\frac{1}{3}\frac{1}{6}$; V = $\frac{2}{2}\frac{1}{6}$; no signs of astigmatism. But the spasm of the orbicularis muscle had decreased in violence so markedly that a relation seemed to exist between blepharospasmus and the action of accommodation. Although the strain of the accommodation which was called for by the slight degree of hypermetropia in this case was small, it could be regarded as a sufficient cause of exciting abnormal muscular action in a "nervous" boy. I therefore advised the use of spectacles (convex 36), expecting that the relief of all extra effort of accommodation would arrest the blepharospasmus.

I saw the patient again on Jan. 20, 1879. He had worn the spectacles only four days; they did not give any relief, on the contrary they made his eyes ache and his head dizzy. The nictitation was worse than in August, the clonic spasms involving all the muscles of the face; especially marked were they about the mouth. Failing to control the spasms by regulating the accommodative action, I concluded that they were probably the result of reflex irritation. While I was vainly seeking for "pressure points" in the course of the supra-orbital and infra-orbital nerves, the boy's mother called my attention to the back part of his head. She mentioned that five years ago he fell from a high fence; his feet were caught by the upper end of the laths, he turned a sommersault and struck the back part of his head heavily against the lower railing. A long while after that accident the back of his head and neck had been painful, and ever since then the boy had been afflicted by attacks of headache and nausea. I found no scar in the skin nor any evidence that the skull had been injured by the fall, but the left occipital nerve was exceedingly sensitive upon pressure at the point where it emerges from the attachment of the trapezius muscle to the cranium. Very gentle pressure upon that point caused a sharp pain which radiated over the whole left side of the head to the eyebrows. A similar, though less acute, pain was felt when the patient bent his head back upon his neck. But if I continued the pressure upon the occipital nerve a few minutes, the twitching of the eyelids subsided, and the patient could open and close his eyelids at will. As the result of my examination I gave the opinion that the contusion the occipital nerve sustained at the time of the injury produced a thickening, a callosity of its sheaths, and left the nerve substance under abnormal conditions. I advised the use of the compound ointment of iodide of potassium.

Feb. 15. Since the 29th of January the patient had no more twitching and no headache. He has an excellent appetite, and a florid complexion.

April 20. The nictitation has not returned; occipital nerve not sensitive to pressure. Boy looks very healthy; has red cheeks and bright eyes. He only complains of frontal headache when he looks fixedly at a near object, for instance, reading over five minutes; never feels it while

out of doors. His headache is due to insufficiency of the internal recti muscles. At twenty feet they can overcome an adducting prism of 3° only, and at reading distance (12'') even the weakest prism, with its basis turned toward the temples, produces double images.

Instructions were given for methodically exercising the weak muscles. The boy began with reading five minutes at three different times every day; and every day the reading was prolonged by one minute. At last accounts (July 8th) he has been progressing so favourably that he could read thirty minutes and longer without the least difficulty.

In the other case the morbid nictitation could also be traced to the traumatic lesion of a sensory nerve, this time it being the supra-orbital branch of the left trigeminus.

CASE II. L. H., aged 12 years, of Evanston, was examined on February 3, 1879. He has never had any inflammation of the eyes, or any difficulty of vision. In May or June, 1878, while playing at base ball he was struck by the bat over the left eye. The wound bled very freely, and healed up slowly, the left side of the forehead being swollen and sore for quite a long time. Several months ago he discovered that the sight of his left eye was imperfect, distant objects appearing a good deal more distinct with the right eye than with the left. Some time since the eyes, but particularly the left eye, have been feeling somewhat sore, and he has been greatly annoyed by the continuous twitching of his eyelids.

He is very fond of books, and is reading all day. Sometimes during reading a mist comes over his eyes and obscures the print; by winking a few times he can clear away this obscuration.

Status præsens.—The eyelids are in a constant motion; they open and shut in rapid alternation. This nictitation persists while the patient is gazing at very distant objects; it is perceptibly increased in violence when he looks at near objects. The lids are normal; the conjunctiva shows a slight degree of hyperæmia, but no hypersecretion of tears or mucus. Exterior of eyeball appears normal; its media are transparent. The ophthalmoscope shows normal fundus in both eyes, with slightly hypermetropic refraction of the R. E., and slightly myopic refraction of L. E.

Vision.—R. E. H. m. $\frac{1}{50}$; V = $\frac{2}{20}$; reads Jaeg. I between 8 and 30 Cm.; L. E. M. $\frac{1}{18}$; V = $\frac{2}{20}$; reads Jaeg. I between 7 and 15 Cm.

Correction of the ametropia of either eye, or equalizing for reading purposes the refractive power of both eyes by a partial correction of the myopia and an overcorrection of the hypermetropia, has no effect upon the nictitation.

At the region of the left supra orbital foramen the eyebrows are intersected by a perpendicular scar of about two Cm. in length. Around it there is a deep callous infiltration of the size of a twenty-five-cent piece, neither painful nor tender on pressure. If a moderate pressure upon the scar is steadily continued the nictitation gradually abates, and finally the lids can be kept open steadily for several minutes.

From this observation I inferred that the clonic spasms of the lids were probably the result of a reflex irritation. May be that the sheath of the supra-orbital nerve was severely bruised by the blow, and thickened by the subsequent traumatic inflammation, or that it became involved in a callous infiltration and abnormally stretched by the contraction of the cicatricial tissues. Acting upon this supposition I prescribed the com-

pound ointment of potassic iodide to be thoroughly rubbed in over the callous scar. The boy remained under my care during four months, and was entirely relieved of the nictitation as soon as the callous disappeared, although once during that time he had a short relapse, due to the irritation of an intervening conjunctivitis, as the following notes of record may show:—

Feb. 22. Infiltration about the cicatrix reduced to the size of a dime. Nictitation markedly diminished.

March 15. Since yesterday lids have been acting worse again; callous infiltration is all gone; scar is soft and movable, but conjunctiva of lids is very red; papillæ of upper lids slightly swollen; patient says it feels as though there is some grit under the lids. Ordered solution of sulphate of zinc.

April 5. Lids do not wink any oftener than normal; conjunctivitis cured.

May 15. No change since last visit.

In these and similar cases, I think, the operation of nerve-stretching could be performed with success if the medicinal applications had not the desired effect.

ARTICLE VIII.

THE PATHS OF CONDUCTION OF SENSORY AND MOTOR IMPULSES IN THE CERVICAL SEGMENT OF THE SPINAL CORD. BY ISAAC OTT, M.D., and ROBERT MEADE SMITH, A.M., M.D., Demonstrator of Experimental Physiology in the University of Pennsylvania.

FROM the time when Alexander Walker in 1809 first formed an hypothesis as to the different functions of the columns of the spinal cord no point in the physiology of the nervous system has been more assiduously studied than the paths of conduction in the cord, and yet in no other subject are the views of investigators more unsatisfactory and conflicting. Apart from the intrinsic difficulty of the subject there is no doubt that while many of the discrepancies are to be explained as owing to the study of different regions of the cord in different species of animals, the main source of error must be attributed to a faulty mode of operation. In the old method of free hand section employed by Brown-Séquard, Schiff, and Longet to whom we owe the most generally accepted views on this subject, the portions of the cord which it was desired to retain intact could scarcely avoid being dragged or pressed upon with a necessary consequence of a disturbance of their function and a complication of the results of the operation. The defects of this mode of procedure have been largely removed by the invention of a special instrument by Dr. Woroschiloff, by means of which any portion of the cord can be accurately isolated and divided with-

out the remaining portion being at all contused or dragged upon in the operation. (For description and illustrations of the apparatus see Woroschiloff, *Ludwig's Arbeiten*, 1874, and Cyon, *Methodik der Physiologischen Experimente u. Vivisectionen*, p. 525.)

Method.—In all our experiments rabbits were used and our investigations only extended to the cervical region. The animals were fastened on Czermak's holder with the head strongly flexed on the neck; after dividing the skin and muscles by a longitudinal incision and hooking back the muscles by weighted cords, the bony vertebral column was trephined over the second or fourth cervical vertebra and the wound carefully enlarged with sharp cutting bone forceps. When bleeding occurred it was checked by bovista and cotton, sometimes aided by artificial respiration. After making whatever division of the cord that was desired, by means of Woroschiloff's instrument, and carefully closing the wound, the animal was allowed to rest in a warm place for about five hours, by which time the shock had entirely passed off, and the degree of sensibility and voluntary motor power remaining in the different limbs tested.

To test sensibility, the extremities were pinched or irritated by an electric current, or occasionally touched with a hot wire, and if the animal moved its head it was inferred that sensory fibres still existed in the undivided part of the cord; if upon pinching the ears movements were produced in the posterior extremities, the conclusion was reached that all the motor fibres were not divided. After having satisfied ourselves as to the degree of sensibility and voluntary motor power remaining, the cord was divided immediately below the medulla, and artificial respiration kept up. The distal segment of the cervical cord was then irritated with a weak induction current from a Valentin apparatus, and since Woroschiloff has shown that in the cervical cord there appears to be a centre which, when irritated, causes co-ordinated movements in the hind limbs, the movements resulting after such irritation in a rabbit with a partially divided cord, were noted as additional evidence as to the number of motor filaments remaining undivided. In all our experiments the results thus obtained agreed with the conclusions drawn from the degree of motion manifested by irritating the ears, nose, etc. The animal was then killed by stopping the artificial respiration, and the segment of the vertebral column containing the portion of the cord that had been operated on cut out and placed for two days in alcohol; the cord was taken out and freed from its membranes and placed for another day in alcohol, and then transferred to a two per cent. solution of bichromate of ammonium. After hardening the cord was imbedded in paraffine, and sections made in a microtome. The sections showing under the microscope the most extensive division of the cord, were selected as indicating the degree of division accomplished in the operation; they were then suitably mounted and drawn. The sections with one or two exceptions were made above the origin of the nerves,

going to the anterior extremities; in the rabbit these nerves arise from the fourth, fifth, sixth, seventh, and eighth pairs of cervical nerves, and first dorsal.

Posterior columns.—The posterior columns have been believed to preside over movements of extension (Bellingeri, Valentin); over movements of flexion (Budge, Harless, Englehardt); both over movement and sensibility (Meekel, Schoeps, Rolando, Calmiel, Jobert); exclusively over sensibility (Bell, Backer, J. Müller, Longet); exclusively over movement (Walker); more over sensibility than movement (Magendie, Seubert); and over anti-peristaltic contractions of the abdominal viscera (Valentin). When associated with gray matter they were supposed to conduct sensation by Fodera, and both sensation and motor impulses by Van Deen and Kürschner. The posterior columns are supposed by Schiff to conduct tactile sensations, and by Todd and Vulpian to be concerned in muscular co-ordination. Several observers (Fodera, Bellingeri, Calmeil, Vulpian, Philipeaux, Brown-Séquard) have stated that division of the posterior columns is followed by hyperesthesia in the posterior extremities; that after section of one posterior column there is hyperesthesia on the side of section and anaesthesia on the opposite side (Brown-Séquard, Vulpian), and that hyperesthesia may be produced by irritation of one posterior column (Vulpian). In our experiments, division of the posterior columns *alone* was followed by no effect but disturbance of muscular co-ordination, more marked when both columns and a portion of gray matter are divided, which gradually passed off in one or two days. No appreciable disturbance of sensation ever occurred. If, however, the section extended through the gray matter then hyperesthesia occurred, and when the section is made so as to include a small portion of the lateral column, then both loss of sensation and motor power occurred, thus showing that in previous experiments in which these results had been said to follow section of the posterior columns alone, either the neighbouring parts of the cord had been injured in the operation or the division was not accurately confined to the posterior columns.

Expt. 30.—Very large rabbit: etherized; tracheotomy. Section of both posterior columns under the second cervical vertebra (Fig. 1) at 11.15 A.M., without hemorrhage; no interference with respiration. 4 P.M., muscular inco-ordination; no paralysis, anaesthesia, or loss of tactile sensibility; no hyperesthesia. Next day inco-ordination less marked, condition otherwise unchanged.

Expt. 16.—Small rabbit: etherized; tracheotomy. Section of right posterior column extending into the gray matter under the second cervical vertebra (Fig. 2) at 11.45 A.M., with very little bleeding. 3 P.M., attitude entirely normal; left anterior foot most sensitive (hyperesthetic) on pinching; no loss of motion in posterior extremities; in jumping, he uses all his limbs equally well; sensation in posterior extremities seems to be equally diminished; right pupil contracted.

Expt. 25.—Large rabbit: etherized; tracheotomy. Section of right posterior column with portion of right lateral column and gray matter under second cervical vertebra at 11.45 P.M., without hemorrhage. 3.30 P.M., there does not seem to be any motor paralysis, although the co-ordination in the posterior extremities

seems to be a little disturbed; the left leg appears to be moved with difficulty, and the animal leans to that side; there is almost absolute loss of sensation in the left hind leg; sensation normal in fore legs.

Fig. 1.

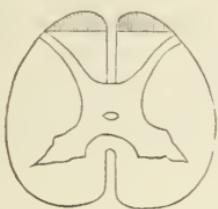
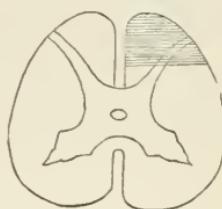


Fig. 2.



Expt. 12.—Medium-sized rabbit: etherized; tracheotomy. Section of posterior column, part of gray matter and part of the lateral columns under second cervical vertebra; no disturbance of respiration at 11.45 A. M.: considerable hemorrhage 3.30 P. M. The only effect appears to be marked want of co-ordination; the animal is unable to make any progression; it appears hyperesthetic all over the body; when the root of the tail is pinched there is a spasmodic contraction of all the erector spinal muscles; when its nose is irritated it makes violent movements in all the limbs.

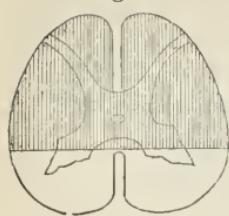
Anterior columns.—The anterior columns have been supposed to preside over movements of flexion (Bellingeri, Valentin); over movements of extension (Budge, Harless, Englehardt); over both movement and sensibility (Meckel, Schöeps, Rolando, Calmeil, Jobert); exclusively over sensibility (Walker); exclusively over movement (Ch. Bell, Backer, Longet, Van Deen); more over movement than sensibility (Magendie, Seubert); over peristaltic contractions of the abdominal viscera (Valentin); and when associated with gray matter over both motion and sensation (Van Deen).

Antero-lateral columns are at present almost generally believed to be conductors of voluntary motor impulses (Brown-Séquard, Vulpian, Schiff), while in the dorsal region the motor fibres are supposed mainly to lie in the anterior columns and in the cervical region in the lateral columns (Brown-Séquard, Vulpian), while Brown-Séquard also believes that the antero-lateral regions contain a few sensory fibres.

The lateral columns were held by Bell to be the path of the sensory nerves of respiration, an opinion which is accepted by Schiff, though by him it is confined to the cervical region. They were supposed by Türek to contain the paths of sensation, and have been proved by Woroschiloff in the lumbar region of the rabbit to contain all the motor and sensory fibres and by Miescher, Nawroeki, and Dittmar to contain all the sensory and efferent vaso-motor fibres of the cord.

Our experiments show that neither motor nor sensory fibres run in the anterior columns, for when the entire cord, with the exception of the anterior columns is divided, the animal is entirely paralyzed and insensible in all parts below the section. The following experiment shows this:—

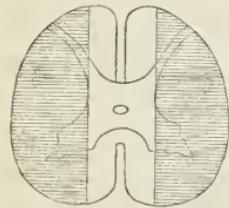
Fig. 3.



movements in the head but none in the limbs; no voluntary movements exist; medulla oblongata divided; its irritation with induction current causes no movement.

Although this experiment shows that neither motor nor sensory fibres run in the anterior columns in the cervical region, it does not disclose their function. It is probable on anatomical grounds (Schröder) that they consist of longitudinal commissural fibres.

It being proved by the above experiment that neither motor nor sensory fibres run in the anterior columns in the cervical region, the following experiment was made to determine whether they ran through the lateral columns:—

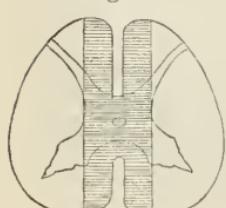


Expt. 21.—Small rabbit: etherized; tracheotomy. Section of both lateral columns under second cervical vertebra (Fig. 4) without hemorrhage; at 11 A. M., respiration ceased, artificial respiration kept up; at 4 P. M., entire paralysis and loss of sensation in all limbs; reflex action present; cord divided; its irritation with electricity produced no movement in the limbs below section.

This experiment in which the gray matter, with the exception of a portion of the cornua, was left intact as well as the anterior and posterior columns, while furnishing additional proof that neither motor nor sensory fibres run through the anterior or posterior columns, also shows the falsity of the opinion held by so many observers (Bellingeri, Calmeil, Schiff, Brown-Séquard, Vulpian) that the gray matter alone of the cord is capable of conducting sensory impressions to the brain, or as some have held, both motor and sensory impressions (Van Deen, Kürschner, Stilling, Calmeil).

This position is further strengthened by the following experiment, the converse of the above, in which the gray matter, as well as the anterior and posterior columns, is divided without loss of sensation or motion, the only effect being marked inco-ordination.

Fig. 5.



Expt. 8.—Medium-sized female rabbit: etherized; tracheotomy. Section of gray matter under fourth cervical vertebra (Fig. 5) at 11 A. M.; respiration not interfered with; animal lies on its side and is unable to get up; irritating ears with electricity causes powerful co-ordinate movements in posterior extremities; sensation appears normal in all limbs; irritating posterior extremities causes movement in head; medulla divided and irritation causes co-ordinate jumping movements in hind leg.

Decussation of Afferent and Efferent Impulse.—From the experiments above quoted it has been shown that in the cervical region of the spinal cord the lateral columns form the ordinary paths of conduction between the brain and the gray matter in connection with the roots of the spinal nerves, while it may be inferred that the gray matter serves essentially for the propagation of reflexes from one spinal level to another. These views are entirely in accordance with our anatomical knowledge of the cord. For since the lateral columns increase in area from below upwards much more steadily than either the gray matter or the anterior or posterior columns, it naturally suggests the view that they are the chief paths through which the brain is brought into connection with the several segments of the cord, and thus with the nerves of the body at large, while we also find that the entrance of any large body of nerves into the cord is associated with a large development of gray matter for the local co-ordinating mechanisms (lumbar and cervical enlargements).

The question now arises, are the afferent and efferent impulses conducted directly in the cord or in a crossed manner. As regards the decussation of motor fibres, Van Kempen, Brown-Séquard, and Schiff, held that there was a partial crossing in the cervical region, and in the other portions a direct conduction, while Vulpian and Woroschiloff believe that there is a partial crossing throughout the entire extent of the cord.

As regards the paths of sensation, Van Deen, Stilling, Brown-Séquard, Türek, and Woroschiloff, believe there is a complete crossing throughout the entire cord, Vulpian that it occurs only to a slight extent, while Chauveau, Von Bezold, and Oré, deny any sensory decussation. Miescher, in studying the paths of the afferent vaso-motor fibres, which are probably identical with sensory nerves, found that the fibres from one sensory nerve (sciatic) passed up both sides of the cord, but that they passed more on the opposite than the same side. The following experiments show the results we obtained in this connection.

Hemisection. Expt. 7.—Large rabbit: etherized; tracheotomy. Hemisection of cord (*left*) under the fourth cervical vertebra, at 12 M., without hemorrhage. Artificial respiration kept up for fifteen minutes, when the animal breathed naturally, the right side possibly being moved more than the left. 4 P. M., animal lies on its left side and is unable to turn over, makes very violent attempts. Upon pinching the nose it moves only the limbs on the right side; sensation appears to be most marked on the right side, though it is present to a considerable degree in all the limbs; the left anterior extremity is paralyzed, left posterior extremity has diminished motion, electro-sensibility seems everywhere about the same; medulla oblongata divided and irritated, causing co-ordinated jumping movements in the posterior extremities, more violent on the right side; rigidity of right anterior extremity. As the cord lost its irritability, motion first disappeared in the left anterior extremity, then in the left posterior extremity, then in right posterior extremity, and finally in the right anterior extremity.

Expt. 20.—Medium-sized rabbit: etherized; tracheotomy. Right hemisection of the cord under the second cervical vertebra at 12.20 P. M., without hemorrhage. 5 P. M., vaso-motor dilatation of the right ear very marked, right pupil smaller; both posterior extremities hyperesthetic; sensation diminished equally in the anterior extremities; no voluntary motion in the left anterior extremity; motor power very much reduced in both posterior extremities, but is almost

absent in the right posterior extremity; reflex activity marked; under ether sensibility disappears first in left limb; medulla oblongata divided; weak induction currents cause movements in both hind legs; more marked on left side; stronger currents arrested motion in right posterior extremity, while it became stronger in the left limb, and even after removal of the stimulus there occurred a number of alternate flexions and extensions of the left posterior extremity.

Section of One Lateral Column. Expt. 11.—Medium-sized rabbit: etherized, tracheotomy. Right lateral column divided between the second and third cervical vertebra (Fig. 6), at 11 A. M.; a little blood was lost in the operation. At the time of section respiration was arrested on one side. 4 P. M., vascular dilatation most marked in the right ear. Right pupil more contracted; hyperesthesia on the right side; sensation diminished in left posterior extremity; diminished power in posterior extremity, especially in the right; unable to maintain an erect position; irritation of the nose causes movements in both posterior extremities, more marked, however, in the left. Medulla divided, its irritation caused rhythmical movements in both posterior extremities, especially in the left.

Fig. 6.

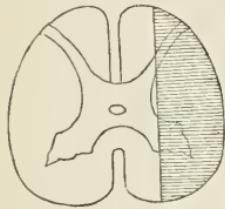


Fig. 7.

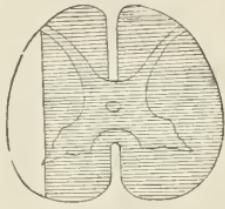
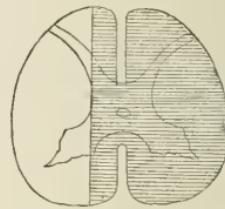


Fig. 8.



Expt. 19.—Large male rabbit: etherized; tracheotomy. Section of the right lateral column under the second cervical vertebra at 11.30 A. M., respiration weaker on the right side at 4 P. M. Sensation impaired in the left hind leg; hyperesthesia in the right posterior extremity; sensation in left posterior extremity almost absent; sensibility more marked in the right posterior extremity; motion more marked in the left posterior extremity; twitching disappeared; animal eats an apple; left posterior extremity more sensitive to electric stimulation than the right. 4 P. M., medulla divided and irritated when movement ensues in the left limbs, very slight in the right, but co-ordinated jumping-like movements take place.

Section of Entire Cord except one Lateral Column. Expt. 26.—Medium-sized rabbit: etherized; tracheotomy. Whole cord divided except the left lateral column under the second cervical vertebra (Fig. 7) at 12.30 P.M.; artificial respiration necessary till 3.45 P.M.; some sensibility in all the limbs. When the nose is irritated, the left posterior extremity only is moved; when the medulla is divided and the cord is irritated, there is extension of the right fore limbs and tetanic flexion of the left, while the right posterior extremity is flexed on the trunk and the left extended in tetanus.

Expt. 29.—Very small rabbit: etherized; tracheotomy. Cord exposed without hemorrhage; section of entire cord except left lateral column, and a very small quantity of gray matter under the second cervical vertebrae (Fig. 8), at 11.53 A.M., without bleeding; respiration ceased on the side of section, 4 P.M.; right ear the most sensitive; on irritating the nose, the animal moves both posterior extremities, the left much more than the right; it also has slight motor power in the left anterior extremity. When the right hind leg is irritated with electricity, coil at 12 cm., motion is caused in the head; irritation of left hind leg only causes movement of head when the coil is at 0; right anterior extremity most sensitive.

From these experiments it is seen that after *hemisection* of the cord sensibility is present in all parts behind the section. When the division is made under the fourth cervical vertebrae, hyperesthesia occurs on the opposite side, and not on the side of section as claimed by Schiff, Brown-

Séquard, etc., while, when the division is practised under the second cervical vertebrae, it appears on both sides, but more marked on side of section. After hemisection, motor power is reduced in both posterior extremities, more marked on the side of section, and, when the division is made under the fourth cervical vertebrae, the fore limb on that side is paralyzed, since the section destroys the portion of the cord from which part of the nerves to the anterior extremity arise. The pupil is contracted on the side of section, and there is vaso-motor paralysis of the ear and weakened respiration on the same side.

When all except one *lateral column* is divided, the ear on that side of section is most sensitive; there is vaso-motor paralysis of ear and contracted pupil on same side. Hyperesthesia occurs in the posterior extremities on the side of section, with diminished sensibility on the opposite side; motor power is diminished in all the limbs, though there is a more marked loss on the side of section; respiration is arrested on the side of section.

It may be concluded, therefore, that there is a partial crossing of both sensory and motor fibres in the cervical portion of the cord in the rabbit, and that there is a greater decussation of sensory fibres than of motor.

The section of a lateral column was followed by hyperesthesia on that side, thus agreeing with the statement of Woroschiloff, that fibres administering to hyperesthesia run in that column.

From thirty experiments on rabbits, all of which furnished results in accordance with the examples we have given, we draw the following conclusions:—

1. That the motor and sensory fibres in the cervical segment of the spinal cord run exclusively in the lateral columns.
2. That the nerves administering to respiration, vaso-motor nerves, and cilio-spinal nerves also run in the lateral columns.
3. That the posterior columns are concerned in co-ordination.
4. That irritation of the cervical cord causes co-ordinated jumping movements.
5. That no sensory fibres pass to the brain in the posterior columns.

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ARTICLE IX.

OBSERVATIONS ON INFILTRATION OF THE RETINA IN LARDACEOUS DISEASE OF THE KIDNEYS DUE TO CHRONIC SUPPURATION FROM BONE DISEASE.
By CHARLES STEDMAN BULL, A.M., M.D., Surgeon to the New York Eye Infirmary.

THE connection between a certain variety of retinitis and chronic renal disease, and that between the latter and chronic suppuration from bone

disease are two facts in pathology long since recognized. The latter fact has lately gained in importance owing to the recent discussion in England before the Pathological Society of London, upon the nature and causes of lardaceous disease or amyloid degeneration. In this discussion, though nothing very new was elicited, yet the recognition of two predominant causes, both alone and together, of lardaceous infiltration, viz.: chronic suppuration from bone caries and syphilis, was so unanimous as to aid materially in the further study of this branch of pathology.

Lardaceous disease of the eye and its appendages is of very rare occurrence, and has hitherto been described solely in the lids and conjunctiva. (See Virchow and Hirsch's *Jahresbericht*, 1873, Bd. I. p. 213. *Annali di Ottamologia*, VI, fasc. 2, p. 163. *Finska läkaresällskap. Handl.*, 1875, p. 150 and 1876. *Archives of Ophthalmology*, VIII. No. 1. *Archiv für Ophthalmologie* Bd. XXV. Abth. 1.)

Certain peculiarities in two cases recently under the observation of the writer have excited a suspicion that lardaceous infiltration may possibly occur in the retina as the result of long-continued suppuration from bone-disease with chronic renal disease, primarily of a lardaceous nature. The suspicion has not become a certainty, for though death ensued in both cases, no autopsy could be obtained in either. The patients in both cases were young, and the histories are here given in detail.

CASE I.—Margaret T., at. 24, single, first seen in January 1879. No strumous taint discernible in any member of the family. No syphilis or rheumatism in the patient, but at the age of eighteen she suffered for nearly a year from malarial poisoning, which however finally disappeared and has never recurred. Eleven years ago, at the age of 13, the left leg was injured by a severe blow upon the crest of the tibia from a fall. This resulted in severe periostitis and necrosis of the bone, which has lasted ever since.

Two operations at different periods for the removal of the diseased bone were performed, with an interval of about a year, but both failed in putting a stop to the destructive process. For the past two years a spine or spicula of bone has protruded through the skin for nearly half an inch, at the junction of the upper and middle thirds of the tibia. This spicula is broad, thick, and roughened, the skin around the opening is livid and presents the ordinary signs of the presence of necrosed bone, and there is a constant thin purulent discharge from the opening. A probe passed in by the side of the protruding spine discovers dead bone in every direction.

During the past year the patient has been in constant ill-health. The menses have been very irregular in time and quantity, and during the past three months have been entirely suppressed. There have been an almost constant headache, occasional vertigo, tinnitus aurium, failing appetite and chronic diarrhoea. There has been at times some œdema of the ankles and face, but not constant. During the past two months there has been a marked febrile attack almost every afternoon, lasting several hours. The amount of urine passed has been very large, especially during the night. There has been no vomiting, no shortness of breath, though there has been slight dyspnoea, and no pain anywhere, except in the head, at any time. During the past four months the vision in both eyes has steadily and some-

what rapidly grown worse, the impairment being most marked in the left eye. For the past year, there has been no treatment of any kind.

When first seen the most marked symptom was the complexion, which was startling in its blanched appearance. The skin of the face and neck was dead white and apparently completely bloodless. The lips and conjunctivæ were almost colourless. The pupils were widely dilated and very sluggish. Radial pulse thready and 90 in the minute. Respirations 20 in the minute, slight but regular. Heart's action feeble but regular. Respiratory murmur heard feebly all over the chest, front and rear. Tinnitus aurium very annoying and constant. Hearing power apparently undisturbed. Drum heads about normal in appearance, and Eustachian tubes freely open.

No central vision with either eye. Eccentrically with nasal side of the retina, right eye $V = \frac{6}{100}$; left eye $V = \frac{3}{100}$; no improvement by any glass. The ophthalmoscopic examination showed a rather uncommon picture. The whole fundus as far forward as the ora serrata presented a brilliant dead white colour, strewn with red spots and lines which proved to be hemorrhages. The optic disk was invisible, but the vessels could be seen converging, though they disappeared at times from view in the infiltration. The infiltration was most dense at the macula and optic disk, and gradually thinned out towards the periphery, there being a difference in elevation of nearly $\frac{1}{4}$. The hemorrhages were most numerous on and near the disk, and were much larger here, some of them being great blotches, though they existed all over the fundus in the course of the venous branches. The symptoms were all most marked in the left eye, but there was no red reflex at any point in either eye. The retinal veins were enormously distended and tortuous, and the arteries in places very much diminished in calibre.

The urine was very light coloured, acid, sp. gr. 1010, contained a large amount of albumen, deposited only a slight precipitate on standing, and contained numerous hyaline and fatty casts. About 11 grains of urea to the fluidounce. No pus nor blood-corpuscles. The quantity passed in the twenty-four hours was very nearly two gallons.

An examination of the abdomen showed that both liver and spleen were enlarged, especially the former. There was no tenderness over any portion of the abdomen, but there was in the lumbar region on pressure. An examination of the blood showed a perceptible though not marked increase in the number of the white corpuscles.

The patient had no appetite, the diarrhoea was quite profuse, and a very unfavourable prognosis was therefore made. She remained, however, under observation from early in January till March 3d, when she died. During this interval she was seen every second or third day, but there were few changes to note. The retinal hemorrhages recurred again and again, and no treatment seemed to avail to stop them. The infiltration remained unchanged till the last, and vision very slowly grew worse. During the first part of February the diarrhoea was somewhat checked, and the amount of urine voided was reduced almost to the normal standard. The albumen also diminished very much in amount, and the casts became fewer. But in the last week in February the amount of urine was largely increased and it became loaded with albumen, though the casts were not materially increased in number.

The patient became suddenly comatose on March 2d, and died on the morning of the 3d. No autopsy was permitted.

In this case the infiltration of the retina was entirely different from that which is met with in the so-called retinitis albuminurica, which occurs in detached masses usually in the vicinity of the disk and macula. This was a continuous dense infiltration reaching from macula to ora serrata without a break, and resembled the exudation met with in cases of suppurative choroiditis occurring in cerebro-spinal meningitis or in general pyæmia, except that the infiltration was in the retina. The numerous and extensive hemorrhages also distinguished it from the latter, and certainly pointed to degeneration of the coats of the vessels. In view of the history of the case, the long-continued necrotic process in the bone, the later renal disease, probably at first lardaceous and subsequently becoming fibrous, producing the contracted kidney, is it not possible that the coats of the retinal bloodvessels, and subsequently the retina itself became infiltrated with this same lardaceous material? The appearances shown by the ophthalmoscope were more pronounced and extensive than the writer had ever seen before in the retina, but early in the same month in which the death of the first patient occurred, a second patient presented himself with almost the same condition of the retina, as follows :—

CASE II.—James F., æt. 26, single, sailor, first seen early in March, 1879. The patient is tall, fairly nourished, but of marked strumous diathesis. Has never had syphilis, rheumatism, or malaria. Eight years ago received a severe blow on the left shin from a chain, which bruised the skin extensively and injured the bone to such a degree that necrosis set in and the wound has been open and discharging ever since. He has never had any continuous systematic treatment, and no operative interference has ever been attempted. Small pieces of bone have come away in the purulent discharge at different times. About four years ago he began to be troubled with nausea and headache, with occasional attacks of vertigo. He also complained of blurring of his sight and of some dyspeptic symptoms in addition to the nausea. For several years, he does not know how long, the flow of urine has been markedly increased, so that he was obliged to rise several times at night. About six months ago the blurring of his vision, which had been transient, became permanent and his sight has steadily grown worse, until for the past month he has moved about only with great difficulty and danger. When he presented himself, the most marked feature was here, as in the first case, the complexion. The colour was a dead, pasty-white, of the same tint throughout, and this extended down upon the trunk and limbs. The conjunctiva, lips, and buccal mucous membrane were almost bloodless. The heart's action was feeble and irregular, and there was a well-marked murmur at the base with the first sound. Pulse 96 and feeble. Respiration 30 in the minute, labored, and each inspiration burried. Auscultation and percussion showed a small amount of fluid in the left pleural cavity. The patient's liver was enlarged to a marked degree and was sensitive to pressure, and he said he had had an obstinate diarrhoea for several months, but that just at this time it was better. He still passed about six quarts of urine daily, which was very pale in colour, had a slight deposit on standing, was acid, sp. gr. 1012. It was loaded with albumen, and contained large numbers of hyaline and fatty casts.

Right eye V = $\frac{4}{20}$ eccentrically.

Left eye V = movements of the hand eccentrically.

Vision in this case was not limited to the nasal halves of the retina, but extended irregularly in all directions towards the temporal side. An ophthalmoscopic examination revealed almost the counterpart of the eyes of the first patient, but with a difference. In the *left* eye the infiltration was continuous and solid from macula to extreme periphery, of a dead white colour, interspersed with numerous red blotches, some old, others recent, which were hemorrhages from the retinal vessels. In the *right* eye the infiltration was not continuous from macula to periphery, but there were patches of red choroid visible. Wherever the infiltration existed, however, it was of the same dense white colour, and in this eye also were numerous hemorrhages, some of them quite large. In both eyes the optic disks were not distinguishable, and their situation could only be told by the convergence of the vessels. In places the vessels would disappear, being covered by the infiltration.

Judging from this second case the infiltration first occurs near the nerve and macula, and subsequently invades the whole of the retina.

In the lower third of the left tibia, near its junction with the middle third, was a ragged, unhealthy ulcer leading down to the bone, its edges elevated, uneven, and purple, and all the tissues in the vicinity were swollen and infiltrated. A probe passed into the tibia upward nearly two inches through a large cavity, and about an inch in all other directions. Dead bone could be felt everywhere, and the end of the little finger introduced into the opening, discovered a loose piece of bone, evidently a sequestrum of some size. The discharge from this hole had been profuse, though thin, and still continued.

The patient's condition was precarious, and his friends were told that he might die at any moment. He lived, however, for nearly two months in about the same condition, though his strength steadily failed. The eyes remained unchanged, except that fresh hemorrhages recurred repeatedly. The nausea towards the end was brought on by every attempt to introduce food into the stomach, though brandy was not rejected. The flow of urine diminished somewhat, but the amount of albumen and the casts remained about the same. He grew comatose two days before death and remained so till the end. In this case also it was impossible to obtain an autopsy. The amount of urea was not determined in this case. The blood was examined, and an increase in the number of the white corpuscles was noted.

A study of these two cases seems to furnish strong evidence of the production of lardaceous disease of the liver and kidney by chronic suppuration in bone tissue with extensive necrosis. It is highly probable that in both cases the primary lardaceous change in the kidney subsequently gave place to a fibrous degeneration with contracted kidney and possibly contracted liver. The retinal disease was in both cases a late complication, and the infiltration was very different from that ordinarily met with in the retina in chronic interstitial nephritis. Albuminuria occurring in cases of long-continued suppuration, or in tuberculous, strumous, syphilitic, or malarial cachexiae, and accompanied by hypertrophy of the liver and spleen, causes a strong suspicion of lardaceous disease. If with *Cohnheim* and some later authors we regard this change as a degeneration, we must recognize it as directly taking the place of the normal protoplasm of the

cells, muscular fibres, capillary walls, etc. The process, be it infiltration or degeneration, appears almost always in the course of a general disease of pronounced progressive character, which is not limited to a single organ. Whether *Cohnheim* is correct in regarding it as a local degeneration produced by general causes, in which the amyloid substance arises directly from the pre-existing albumen of the tissue, remains still a moot point. *Wagner* regards the lardaceous disease as in all probability a link between albuminates and the fats and cholesterine. As regards the suggestion of lardaceous infiltration of the retina made in the two cases reported, we must recollect that the retina is largely made up of connective tissue, and that lardaceous infiltration of this tissue is a point in pathology still unsettled. At the same time the retina is a highly-developed nervous tissue, and lardaceous disease of nerves has been reported in a number of instances as actually found, so that its occurrence in the retina is certainly possible.

Dr. Dickinson holds the view that the special change is an infiltration of the tissues by a material foreign to their healthy nature, which in all probability is brought to them by the bloodvessels, but in this view he stands almost alone among English pathologists. As regards the causation, most writers attribute the change to but two causes, viz.: chronic suppuration and syphilis. Of 83 cases of lardaceous disease collected from the post-mortem records of St. George's Hospital, 73 were in connection either with protracted suppuration or syphilis; of these, suppuration occurred in 62 and syphilis in 18.

Dr. C. Turner found a total of 58 cases of lardaceous disease in about 2200 autopsies, and of these there were only 10 in which the disease was not clearly associated with suppuration or syphilis.

According to *Dr. Hilton Fagge*, there occurred in Guy's Hospital 244 cases of lardaceous disease in 20 years, and of these 154 were due to suppuration without syphilis, and 76 were due to syphilis. Of the latter 34 had bone-disease, leaving 42 cases presumably due to syphilis alone.

As to the way in which suppuration produces the disease, there is an enormous loss of certain constituents of the blood, notably of the white corpuscles, carrying away the potash, and the lardaceous material may be regarded, according to *Dickinson*, as a deposit from the residuum. But in the two cases reported by the writer, there was a slight increase in the number of the white corpuscles instead of a loss.

When we come to consider syphilis as the cause, we are still unsettled as to its mode of action. Of course syphilis involves injury to nutrition in a variety of ways. *Dr. Greenfield* has seen lardaceous disease well-marked in both congenital and acquired syphilis, without any antecedent suppuration. On the other hand *Mr. Hutchinson* deems it improbable that the mere existence of a syphilitic taint could produce the disease without the intervention of a suppurative process. He is inclined to accept one of two explanations of the process; either that the protracted suppuration

attendant on certain severe forms of syphilitic ulceration of skin and bone produces general lardaceous tendencies, just as other prolonged forms of suppuration would, or else that syphilitic gummatous formations are themselves locally liable to lardaceous changes. He recognizes the fact that syphilitic patients occasionally fall into a hopeless cachexia, and that here extensive lardaceous changes are believed to have taken place, but he believes that severe suppuration always precedes the cachexia.

In an interesting paper by E. Bull in the *Nordiskt Medecinskt Arkiv*, Bd. X., 4de Häftet (Nogle Kritiske Betragtninger over den amyloide Degeneration, særlig med Hensyn på dens Varighed og dens Forhold til den Bright'ske Retinit). the author holds that the kidneys are the earliest and most severely affected by amyloid disease of all the organs in the body, and that the disease is immediately marked by albuminuria. In the greater number of cases its duration is as a rule less than a year, and sometimes only a few months. Exudative retinitis he believes does not occur in uncomplicated amyloid degeneration. He also thinks that the cases of long duration of amyloid disease, which have been reported, are due to a faulty conception of the pathological process. They should be regarded as cases of primary renal cirrhosis with subsequent amyloid degeneration occurring towards the end of life. These views are not new, and are the ones generally held now by the profession. They point strongly towards the improbability of retinal complications in pure amyloid disease of the kidneys, and indirectly against any such degeneration of the retina as has been suggested in the two cases reported in this paper. These cases were, however, ophthalmoscopically unique of their kind, at least in the experience of the writer, nor has he seen a report of any similar case. It is not known in what condition the retina was at the beginning of the infiltration, and it is possible that the exudation began as in ordinary Bright's retinitis; but its course and termination were totally different, and the supposition advanced seems not unreasonable, though it is novel. Of course the crucial test, microscopic examination of the infiltrated membrane, is wanting, and hence the histories are defective.

47 EAST TWENTY-THIRD ST., NEW YORK.

ARTICLE X.

CASE OF HYSTERICAL TETANUS. By D. WEBSTER PRENTISS, M.D., Professor of Materia Media and Therapeutics, National Medical College, Washington, D. C.

Mrs. M., Irish, aged 22 years, married, previous health good, intemperate habits, was confined two years before present attack at Columbia Lying-in Asylum—being at the time unmarried. Lingering labour, with adherent placenta. Four weeks in hospital.

At this date (April 16, 1879) is again pregnant, seven and a half months, having last menstruated August 25, 1878.

April 16, 1879. Taken suddenly at 6 P. M. with screeching noise in ears. "Deaf and blind." Tonic spasms of flexor muscles of arms and legs, recurring constantly for two hours. Seen during night by Dr. Glen-nan; thought to be dying, and was anointed with the "last unction." After two hours got a little rest between the spasms—from five to fifteen minutes—until 1 o'clock, when she went to sleep and slept till morning.

17th. Taken again with spasms of muscles at 9 o'clock A. M., lasting two or three minutes, and recurring every fifteen or twenty minutes until 1 o'clock, night, when they ceased and sleep supervened, lasting until morning. Brom. potas. gr. xx; com. spt. ether f₅ss was given every two hours without effect, as also was chloral in gr. xx doses.

18th. Paroxysms returned at 8 o'clock A. M. with greater violence than ever; marked opisthotonus, the body being bowed until only the head and heels touched the bed. Jaws clinched, eyes closed; unconscious during paroxysms, which lasted about four minutes; passed off with prolonged holding of the breath, succeeded by a deep drawn sigh and complete relaxation. Hydrate chloral gr. xxx was ordered every two hours. She had two or three attacks, each with violent opisthotonus up to 9 P. M., after which she slept all night. Four doses of the chloral (3ij) had been taken. No return of the tetanic spasms the next day.

The patient was greatly debilitated, but recovery was uninterrupted. Labour did not supervene until the regular time.

This case is of interest as presenting rather an unusual form of hysteria, and also in a diagnostic point of view, as being differentiated from tetanus proper and strychnia poisoning.

The thought at first suggested itself that possibly bad whiskey containing strychnia might be to blame for the symptoms presented.

The points in the case marking it as hysterical are:—

1. It was ushered in by noise in the ears, deafness, and blindness.

In true tetanus and strychnia poisoning the senses are rendered preternaturally acute.

2. There was unconsciousness during the paroxysms.

This never occurs in tetanus and strychnia poisoning except as an ante-mortem condition.

3. The eyes were closed during the spasms. The eyes stare widely open in the other diseases.

4. The long uninterrupted sleep at night. In this particular there is a resemblance to chorea. In true tetanus there is no such relief until convalescence. It is noticeable also that no relief followed the administration of chloral until it was given in thirty-grain doses.

ARTICLE XI.

DISLOCATION OF THE HIP IN CHILDREN: A REPORT OF TWO CASES WITH REMARKS. By V. P. GIBNEY, A.M., M.D., of the Hospital for the Ruptured and Crippled, New York.

THE occurrence of this accident in children is of sufficient rarity to justify me in placing on record two cases alike as to kind yet unlike as to etiology. The one is purely traumatic, and apart from the age of the subject is interesting in a diagnostic point of view as well as in the fact that *six weeks* elapsed before its reduction; the other is a spontaneous dislocation with the early stage of hip disease.

CASE I. *Traumatic Dislocation in a Child aged 4 years; Reduction at end of six weeks by Manipulation; Perfect Restoration.*—On the morning of June 24, 1878, Mrs. F., of Williamsburg, brought her boy Alexander, *aet. 4 years*, into the out-door department of the hospital, and, from the degree of care with which she handled the child, I suspected some acute disease about one of the larger joints. He could not be induced to stand unless well supported, would make no attempt to walk, was thin, and to all appearance a sufferer. He was, moreover, exceedingly cross, and an examination thoroughly satisfactory was impracticable. I did find, however, as he lay upon the table, a rotation inwards of the right thigh with flexion to an angle of at least 120° and a strong degree of adduction. The knee of this side rested across the lower third of left thigh, the trochanter was unusually prominent, and rested on a higher plane than that of left side, the outline of the head of the thigh-bone I fancied could be distinctly made out on the dorsum ilii, and the length of the limb I made out to be between three-quarters and one inch less than that of its fellow. I could make flexion over a small arc, and extend to an angle of about 140° without causing any pain, but I could not make any abduction. I learned from the mother that five weeks before this date the child was free from any lameness or sign of disease, that he was playing in the yard at that time, when he fell into a cellar, the door of which had been left open, was picked up by a neighbour and carried into the house crying considerably with pain in his hip; that he was unable to use his limb, and that a degree of deformity existed, so much so, that she called in a doctor, who is reported to have examined the case very carefully and to have found nothing demanding any urgent treatment, but to have ordered the child to bed with limb extended and a pillow between the knees. Since the accident the patient was reported to have rested well at night and to have suffered very little pain.

I had no hesitancy in making a diagnosis of dislocation on the dorsum ilii, and advised the mother to place the child in the hospital. This she declined to do without seeing her husband, and she took the child home to consult his wishes in the matter. She did not report for several days, and then she was unwilling to leave the child. She begged that I treat it as an out-door patient. The case was of such extreme interest that I determined to make the attempt at reduction, and, on the evening of June 29, I had my friend Dr. Jno. H. Ripley, of this city, see the patient with me. He fully confirmed the diagnosis I had already made, and we proceeded at once to reduce the dislocation. Chloroform was administered, and

when anaesthesia was complete, the limb was rotated, while the thumb and fingers grasped the head of the thigh-bone, which could be felt to roll distinctly. The doctor made out the same shortening that I had made out some days previously. With the aid of a towel I held the pelvis quite securely, while Dr. R. manipulated the limb. He flexed the thigh acutely on abdomen, rotated inward, then extended. This was of no avail. He then flexed and abducted and extended, and the deformity remained the same. Every possible manoeuvre was resorted to, and for fully one hour we worked without any success whatever. Finally, after a strong adduction and careful extension, the bone could be felt under one's fingers to slip into place. There was no noise made, and we were only assured of our final success by finding the limbs parallel, equal in length, and the movements at the joint normal. A double spica bandage was applied, the limbs bandaged together, straight splints having been bound in popliteal space, and a pad having been placed between the knees. An opiate was ordered for the night.

July 1. Find child free from pain, and the mother reports that after the first night he rested very well. The bandages are removed to-day and the limbs remain quite straight; passive motion made with comparative ease and the dressings re-applied. An enema is ordered.

6th. Mother brings child to the dispensary to-day and reports that he has rested well and been free from pain since I saw him last (*July 1*). The limbs are of equal length, and both lie straight and parallel, one with the other. There is a moderate degree of resistance to complete extension, flexion, and adduction, though the thigh can be moved in flexion over an arc of about 90° with ease, and rotation can be made with the same degree of facility. Only a spica worn now.

11th. Continues to improve. Occasionally has a "catching pain" as he walks.

24th. Flexion can be made over the normal arc; rotation not quite perfect. Walks much, and a very slight halt is observable.

Aug. 3. Walks and runs quite freely, and I cannot detect any halt in his gait. The mother says she cannot tell by his walking which is the lame limb. Flexion and extension perfect and painless; rotation nearly so; a scarcely appreciable change in the nates; no atrophy; no shortening; general health good.

Jan. 8, 1879. In tracing out some cases I called at the residence of this patient and found that he had been free from any pain or lameness since the date of his last visit (*Aug. 3*). I had him stripped, and on a thorough examination I could find no symptom or sign of disease about the joint. His rotation was perfect.

Dr. Hamilton, while regarding dislocation in a child at this age as rare, very truly remarks:¹ "Coxo-femoral dislocations may occur at any period of life." I find by reference to modern literature of the subject that the accident has happened to children as young as eighteen months. It is quite unnecessary for me to refer to the cases under ten years, or under six even, that have been reported within the past few years. The textbooks on surgery contain such as are well authenticated.

It seemed difficult to imagine how any error in diagnosis could have

¹ Fractures and Dislocations, Philadelphia, 1875, p. 673.

occurred, and yet such appears to have been the case. There was certainly the history of the fall, the deformity and the acuteness of invasion. We are taught that hip disease comes from a fall, and hence the average practitioner feels satisfied when he gets this etiological factor. He seems to forget that hip disease goes through stages, and that a *long time* must elapse before such a deformity as was described in this case can take place.

If this injury were not severe enough to induce an arthritis, then it is useless to talk of falls as causing hip disease. It is fair to assume that the ligamentum teres was either torn across or severely stretched, and we must admit a certain amount of injury done the capsular ligament. Then, too, the bruising and pulling and tortion that was incident to the efforts at reduction were certainly sufficient to cause disease in the joint, even if it had already escaped permanent injury.

There are cases, it is true, wherein violent inflammatory reaction has followed prolonged manipulation in the effort at reduction.

The period of time that had elapsed in this instance was not sufficient to justify me in dismissing the case without an attempt to restore the head of the bone to the acetabulum. Sir Astley Cooper fixed eight weeks as the limit beyond which it is dangerous to make the attempt. Most all authors dwell on the dangers attendant thereon, and cite numerous examples. For a full history I need only refer my readers to that classical work with which every tyro even in surgery should be familiar, viz.: Hamilton on Fractures and Dislocations, to which reference has already been made.

One other point in connection with this case, and I pass to the narration of the second. The head slipped in without that well-known "click" so pleasing to the ear of the operator. In many of the reported cases of ancient dislocation reduced, I see almost invariable mention of this "click" as occurring, however late the reduction.

Erichsen states in speaking of the effects of a dislocation left unreduced:—

"If the articulation be an orbicular one, as the shoulder or hip, the cavity, whether glenoid or acetabular, undergoes very gradual changes in outline and depth; its circumference becomes contracted, less regular, more angular, and the hollow eventually shallows. These changes are so slow in the adult that several years will elapse before they have gone to such a degree as to prevent the displaced head of the bone from being put back. In *children and young people* [my own italies] they are more rapid and complete, and the cavity fills up with a dense fibrous deposit."¹

CASE II. *Spontaneous Dislocation occurring in the early stage of Hip Disease; Reduction.*—During the month of May of the present year a female patient aged nine years, was in the hospital convalescing from a recurring acute attack of hip disease. She had for some weeks been walking and running about with scarcely a halt in her gait, when on May 26th a member of the house staff observed a shortening of the limb, and a refusal on the part of the child to walk. Dr. Knight's attention was called to the case, and an examination revealed an unmistakable dislocation on the dorsum ilii. The limb was shortened one inch, was apparently much

¹ The Science and Art of Surgery, Phila., 1878, vol. i. pp. 458, 459.

shorter, the thigh was semi-flexed, rotated inward, and adducted. A few days before this the limbs were of equal length, and were free from any deformity. The child reported that she fell out of her bed a night or two previously, but on a careful investigation, this was found impracticable, as the beds in the dormitory are so close one to the other, that a child could not fall between them. Furthermore, on questioning both the day nurse and the night nurse, as well as the children who sleep contiguous, no one saw her fall from the bed, and all are positive that she did not.

I was in the country at this time, and as I was expected home every day Dr. Knight postponed the reduction until my return.

May 30. Chloroform administered and the diagnosis was fully confirmed. After a few minutes at manipulation, the head of the femur slipped into place without any "click." Measurement made, and limbs found equal in length. While applying a roller about the hips, the head of the bone slipped again but was easily replaced. No grating could be felt. Extension by weight was made, and during the day she suffered considerable pain in paroxysms.

31st. Limb retained in position, though the child required an opiate to secure rest through the night.

June 2d. Extension removed, firm spica applied with pad above trochanter and child carefully placed in a rolling chair.

4th. Doing well; pains not so great.

14th. Since date of last note the case has progressed as well as we could expect. The dressings have been carefully removed and reapplied every other day to avoid excoriations. Any movements at the joint have caused the child to scream aloud. This noon while passing through the ward, I observed the limb sharply flexed, adducted, and rotated inward, along with a marked degree of shortening. An anaesthetic was administered, and I could feel the head of the bone distinctly on the dorsum, and made out one and a half inch shortening. It was easily reduced and child placed in bed with usual precautions.

15th. This morning the hip is dislocated again. Dr. Ap. M. Vauce, a member of the staff, makes a splint of Manilla paper and glue in the same manner as he makes his spinal jackets. He gets his cast from a boy whose limb is equal in length and size to our patient's, and the whole dressing dries and is ready for application by this evening.

16th. Splint applied after reduction is made; it grasps the pelvis in a broad band, and completely encases thigh and knee and is held securely by a lacing in front throughout the whole length.

22d. We have had no difficulty with the limb since the paper splint was applied. The child goes about now quite freely by aid of a chair. We have had no excoriations.

July 30. Date of present writing. Limb equal in length with its fellow. No deformity, child free from pain, and ease in every way doing well.

The history prior to the dislocation is of much interest in illustrating the peculiar course taken by the hip-disease, and is as follows:—

Aug. 13, 1877, she was admitted to the hospital, and nothing reliable could be learned concerning the health of either father or mother. The patient herself was one of fifteen children, six of whom had died of the ordinary diseases of infancy. She was healthy during infancy, and a pertussis at the age of four without a sequel was all the disease she had ever had.

Four months ago she began to limp and complain of pain in the left ankle. She is reported to have sustained a slight fall about this time, and to this accident was attributed her lameness.

On admission she is found fairly nourished, stands squarely on both feet, and walks quite freely, though favouring left side. The spinal column is normal to the usual tests; the left nates is flattened a little while the fold is unchanged; no tenderness on pressure in groin or over trochanter, and the child does not complain of pain if pressure be made at any point around hip or along thigh; no single muscle or group of muscles shows any contraction. In the dorsal decubitus (examination made on the hard floor) the thigh can be completely extended without resistance; ab- and adduction easily performed but there is resistance to complete flexion, although the child does not complain of pain; no atrophy of thigh or leg, and no shortening. A diagnosis of hip disease first stage was made and the treatment was expectant.

Oct. 2. Not an outward symptom or sign has developed since her admission; even those present then have subsided, and we are disposed to question the diagnosis. Discharged this day without any evidence of disease or deformity.

March 12, 1878. Readmitted this date. Unable to walk without great difficulty, and in this act leans forward and rests hand on the knee. The relapse is of two weeks' standing. About six weeks ago she had scarlatina with enlarged cervical glands as sequel. The thigh is flexed at 90° and is rotated outwards. There is no especial fulness or induration about the trochanter or in the groin.

14th. Has cried much with pain during the past two nights, and fly blister to the hip is applied. Poultices to follow.

22d. Since date of last note has experienced great relief: walks with a mere trace of a limp, has no pain at nights, the limb is perfectly straight, motion at the joint is good, and there is scarcely any appreciable change in the nates.

Aug. 5. Has had no sign of relapse since last spring. She has just returned from a visit home, and would be discharged but for an occasional halt in her gait, and a resistance to complete flexion.

March 15, 1879. Condition unchanged and we still hesitate about granting a discharge.

17th. For past two days has been very lame, and the limb is apparently lengthened. This is the season when the "walking mania" is at its height, and her relapse is possibly due to over-exertion, as the children in the hospital have caught the infection. Rest is enjoined.

23d. Relieved, and her condition is now as it was before the 15th.

She continued thus apparently cured until the date of the dislocation in May, which has already been fully described.

Commenting on this case, I feel no hesitancy in predicating spontaneous of this dislocation. Whether it occurred as the child was falling asleep or towards morning I am unable to state. The case reported by Mr. Hilton¹ was one wherein the dislocation occurred just as the patient was falling asleep; and commenting on this he says:—

"Here I think it worthy of a passing consideration to inquire why it is that these dislocations from disease almost always occur just as the patient is falling

¹ Lancet, vol. ii., 1868, p. 2, also in "Lectures on Rest and Pain."

off to sleep. It is then that volition has withdrawn its influence from the nervous system generally, and the excito-motor function of the spinal cord seems to obtain an exclusive authority over the limbs, and produces the involuntary spasmodic condition of the muscles which causes these displacements."¹

The case I have reported differs from most of those already on record. Until the remarkable paper of Dr. Alden March in 1853, before the American Medical Association, dislocation of the hip in hip disease was regarded by nearly all of the surgical authorities as of frequent occurrence. It was of so frequent occurrence, said they, that we must expect nothing else in the advanced stage of the disease. Dr. March took the position that "*spontaneous dislocation of the hip (as purely the result of morbid action unaided by superadded violence) seldom or never takes place;*"² and he proved his position by overwhelming evidence. He stated that the symptoms which are usually relied on during life as diagnostic of an idiopathic dislocation can be explained "in the strongly marked organic changes in the form and relations of the head of the femur and acetabulum."³ I have myself demonstrated another element in the production of this deformity, with specimens presented at the New York Pathological Society,⁴ viz., a change in the angle which the neck sustains to the femur—in disease the angle is changed sometimes from an obtuse to an acute angle.

In a pretty careful search through such literature as I have at hand I am unable to find any cases recorded wherein the dislocation occurred in the early stage of the disease, and one might say that the case I have reported was not one in point. The facts are: signs of disease beginning in May, 1877; gradual disappearance of every sign by October 2 of same year; perfect immunity from lameness or deformity until February, 1878; scarlatina, and relapse of disease at hip; re-admission to hospital with acute symptoms; almost perfect recovery within a month, and this condition maintained for one year; then the dislocation coming on at night. It will be seen that she never passed to the stage of abscess, and that at the time of the accident there was very little evidence of any disease whatever about the joint. When, then, I say in the early stage, I speak relatively. Last spring I assisted my friend, Dr. Poore, of this city, in making an autopsy on a child who died of this disease after a few months' illness. The right hip had become spontaneously dislocated a short time before death, and the doctor and myself found it easily dislocated shortly after the slipping was observed by the nurse. We found the capsular ligament intact, but the ligamentum teres destroyed by ulceration. Dr. Poore has the specimens in his possession, and will publish a full report of the case at no distant date. The conclusion to be drawn, then, is that in the case

¹ On Rest and Pain, N. Y., 1879.

² Trans. Am. Med. Assoc., 1859, p. 479.

³ Loc. cit., p. 479.

⁴ Medical Record, vol. xii. p. 253.

I have reported the ligamentum teres must have been destroyed, and the absence of crepitation would seem to limit the disease as yet to the soft parts, and more especially to the ligament. The absence of the "click," too, would aid us in locating the lesion.

One point of interest to the pathologist, and I have done. If hip disease begin, as is claimed by some authorities, in the soft parts within the acetabular cavity, why do we not have more dislocations in the early stage? It certainly cannot be that such accidents are prevented by the early use of mechanical appliances; for, as yet, the major portion of patients suffering with this disease either have no apparatus, or have apparatus so abused in its application that it practically amounts to harm. I report this case as a rare case, and the rarity is due, in my opinion, to the infrequency with which the disease begins in the soft parts. The far greater number of cases of hip disease, I am convinced from observations extending over several years, begin as an osteitis of the head, of the neck, or of the acetabulum.

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ARTICLE XII.

A CONTRIBUTION TO THE STUDY OF TRUE ADENOMA OF THE MAMMA. By SAMUEL W. GROSS, A.M., M.D., Surgeon to the Jefferson Medical College Hospital, and to the Philadelphia Hospital.

UNDER the term adenoma, or some of its synonyms, as *tumeur adénoïde*, *hypertrophie partielle*, *adenocele*, or *mammary glandular tumour*, Birkett, Broca, Velpeau, Lebert, Bryant, and Paget have described growths which differ widely in their genesis, intimate nature, and clinical features, and which are composed, for the most part, of the remains of preëxisting lacteal glands contained, but widely separated, in a fibromatous, sarcomatous, or myxomatous stroma. The above names would naturally lead one not familiar with modern histological research to infer that tumours developed at the expense of the secreting structure of the breast are of very frequent occurrence, while the fact is that there is not a single neoplasm of that organ which is so uncommon,¹ and about which so little is known as genuine adenoma. Many noted pathologists have never met with it, and it is very certain that the peculiarities in its life are lost in the writings of the authors that I have mentioned. As I have had an opportunity of examining two specimens, I am induced to lay the results of my investigations

¹ I have seen true adenoma only once out of 115 tumours of the breast, of which I have kept a record, and Billroth (*Chir. Klinik*, Zurich, 1860-67, and *Wien*, 1869-70) records only one example out of 102 mammary growths.

before the profession, and endeavour, by comparing them with other cases, confirmed by the microscope, to contribute something tangible towards the histology and general pathology of this formation.

The passive mature mamma consists merely of ducts with a few appended small lobules, widely separated from one another in a dense fibrous stroma. During its perfect physiological evolution, such, for example, as is witnessed at the first pregnancy, the glandular structure proliferates, through which there is a partial new growth of acini and ducts throughout the organ, which are contained in a vascular, succulent, loose, and comparatively sparse connective tissue, which is, moreover, rich in cellular elements. Pathologically, a new formation of lacteal glands takes place through a process of budding into the proportionately scant interstitial tissue, so that they preponderate, and represent a simple hyperplasia of the glands as a whole, and not merely of their investing epithelium, as is taught by most authors. A neoplasm which presents a likeness to the mamma of a female advanced in gestation may be styled a typical or pure adenoma, which probably represents the early stage of development of all growths of this class. Their occurrence is, however, so very rare it might be doubted, were it not that Cornil and Ranzier,¹ Waldeyer,² Lucke,³ Foerster,⁴ and Wilks and Moxon,⁵ refer to tumours in which there seems to be only an excessive production of the glandular apparatus, as the acini, along with their epithelium, preserve their natural form and size and arrangement, are provided with a central lumen, and are contained in a relatively small amount of connective tissue; and this description agrees with that of Deffaux,⁶ excepting that he states that the acini are greatly dilated.

In addition to typical, or as it may be termed, hyperplastic adenoma, there is an atypical tumour, which is characterized by changes in the form, dimensions, and grouping of the epithelium of the enlarged and deformed acini, but in which the proper membrane of the latter is preserved, whereby it is distinguished from carcinoma.

CASE I.—Four years ago I removed from the upper and inner circumference of the breast of a prolific married woman, forty-six years of age, a tumour of three years' duration, which was hard, perfectly mobile, bossulated, almost spherical, of the volume of a walnut, and unattended with pain, tenderness, or alterations in the skin, nipple, veins, or axillary glands. On section, the white, but here and there rosaceous white, basis was dotted, but not to any considerable extent, with cavities, none of which were larger than a small pea, which were filled with a yellowish pultaceous or atheromatous material that could be expressed as small plugs. Under the microscope, the greatly enlarged acini were seen to be packed, for the most part, with large, round, angular, elongated and polyhedral cells, which had undergone fatty

¹ Manual d'Hist. Path., vol. i. p. 291.

² Virchow's Archiv, vol. xli. p. 516.

³ Pitha and Billroth's Hdbch. der Allg. und Spec. Chir., Bd. ii. Abth. 1, Heft. 2, p. 280.

⁴ Hdbch. der Path. Anat., 2d ed., vol. ii. p. 480.

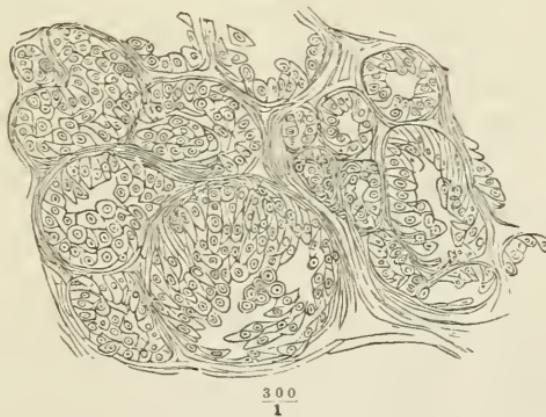
⁵ Lect. on Path. Anat., Phila. 1875, p. 583.

⁶ Contrib. à l'étude des Tumeurs du Sein d'origine Epithéliale, p. 17.

degeneration in the centre of the largest acini. The connective tissue was present in much less abundance than I have even ever witnessed it in a lactating mamma, and it was in parts the seat of small-celled infiltration. Although the enlargement of the acini was similar to that met with in the secreting breast, the atypical grouping of the large and deformed cells served to distinguish the structure from that of the functionally active mamma, while from the presence of the atheromatous moulds, and the exclusive enlargement of the acini, the tumour is to be classed as a cystic acinous adenoma, the contents of the cavities being due to fatty transformation and caseation of the epithelium.

The neoplasm in question corresponded almost exactly to a hard, lobulated, mobile growth, of twenty-three months' standing, and as large as a child's head, which Billroth extirpated, in 1863, from a prolific female, forty-two years of age. The cut surfaces were more extensively pervaded by atheromatous cysts, but the characters of the epithelium which filled the dilated acini were precisely the same, while the moderately thick inter-acinous connective tissue was slightly infiltrated with small round cells. From its peculiar appearances, Billroth¹ at first called it genuine glandular epithelial sarcoma; and Rindfleisch,² who likewise studied its minute features and has represented it in his *Pathological Histology*, Fig. 1, which I introduce in this paper for the purpose of comparing it with the succeeding illustration, regarded it as adenoma or caneroid hypertrophy, and did not

Fig. 1.



object to the name applied to it by Billroth. From this unfortunate nomenclature the term epithelioma is now used for these tumours by Labb   and Coyne,³ Malassez and Deffaux,⁴ and Duplay,⁵ although Neumann,⁶ Langhans,⁷ Cornil and Ranvier,⁸ Waldeyer,⁹ Klebs,¹⁰ and L  cke¹¹ adhere to ade-

¹ Hdbch. der Allg. u. Spec. Chir., Bd. 3, Abth. 2, p. 83.

² Pathological Hist., p. 537.

³ Tumeurs B  nignes du Sein, p. 333.

⁴ Op. cit.

⁵ Trait   El  mentaire de Pathologie Externe. Par Follin et Duplay, vol. v. p. 632.

⁶ Virchow's Archiv, vol. xxiv. p. 326.

⁷ Ibid., vol. lviii. p. 147.

⁸ Op. cit.

⁹ Ante.

¹⁰ Hdbch. der Path. Anat., p. 1201.

¹¹ Ante.

noma. Had the French authors not overlooked a subsequent paper in which Billroth¹ gives a more detailed account of his case and calls it cystoid adenoma, this confusion would not have arisen, which is to be regretted, as epithelioma implies the structure of so-called canceroid as met with in other tissues and organs. Even as a generic term, it is most objectionable, unless carcinoma, which is also an epithelioma in the sense of its arising from epithelial elements, be designated atypical, carcinomatous, or infiltrating epithelioma, to distinguish it from adenoma, which would then be regarded as typical, non-carcinomatous, or circumscribed epithelioma. From the fact, however, that the epithelial elements of adenoma may be, and usually are, irregular in their size, form, and arrangement, and thus produce an atypical epithelioma, which differs widely in its structure and life from carcinoma, the term had best be dropped altogether.

As I have just pointed out, adenomas are usually composed of enlarged acini, with aberrations in the characters of their investing epithelium, although they may be constituted mainly of newly-formed ducts. When the acini predominate, they may be termed acinous, while they may be called tubular when the ducts preponderate. Of the fourteen cases of which I have complete accounts, ten were atypical acinous growths, which include three recorded by Labb   and Coyne, two by Fochier,² and one, respectively, by Steudener,³ Neumann, Billroth, Nancerede,⁴ and myself, and four were tubular, the latter having occurred in the practice of Billroth,⁵ Langhans, and Morton. Hence, it would appear that pure or typical acinous adenomas are very uncommon, that atypical acinous growths constitute the majority, and that the tubular are comparatively rare. Through the kindness of Dr. Longstreth, to whom I am also indebted for its history and gross appearances, I recently had an opportunity of making a minute examination of the specimen of the tubular variety removed by Dr. Morton at the Pennsylvania Hospital, and of which the following is an abstract:—

CASE II.—A spinster, fifty years of age, first noticed, about eighteen years ago, a small tumour of the left breast, which remained stationary for eight years, when it began to increase, and, at the expiration of twelve months, burst and discharged a sanguinolent fluid, after which it entirely disappeared. At the end of four months, another nodule occurred immediately beneath the site of the previous one, which, in its turn, at the expiration of thirty months, opened, and was the seat of a constant slight discharge. About four months before admission, the swelling increased very rapidly, and the discharge became more profuse and more offensive, was occasionally bloody, and caused her to lose flesh and appetite. On admission, there was a moderately soft, and somewhat lobulated, tumour, of the volume of a child's head, dependent from the outer side of the breast, the surface of which was ulcerated, and covered with stinking clotted blood and purulent matter

¹ Langenbeck's Archiv, vol. vii. pp. 860 and 871.

² Lyon M  dicoale, vol. xiv. p. 142.

⁴ Trans. Path. Soc., Phila., vol. vi. p. 113.

³ Virchow's Archiv, vol. xliv. p. 42.

⁵ Loc. cit., p. 861.

On pressure, a thin sanguinolent fluid was discharged in jets. The lymphatic glands of the axilla and neck were normal. The tumour was removed, and she was well a month subsequently.

The surface of the growth was uneven and nodulated from underlying cysts, which were filled with blood, and the skin towards its base was of a purplish tint. Its diameter was three inches on a level with the chest wall, its height was six inches, and the fungous protrusion had a breadth of six inches. On raising the mass there was a pit deep enough to lodge the tip of the index finger on its inner side, which represented the retracted nipple. On making a section of the tumour tissues of varying appearance were brought into view. The surface was found to consist, in part, of necrosed skin, infiltrated and blackened by blood, and, in part, of crusts of blood. Beneath this were cysts, which varied in size from a pin's head to a walnut, filled with bloody fluid, and possessed of thin and membranous and blood stained walls. In the middle third of the growth the cysts were, as a rule, of larger size, and separated by thick bands of discoloured tissue. In the lower third of the section the tissue was of an opaque white colour, exuded a thin, semitransparent, whitish fluid, and resembled gland tissue, but its consistence was more elastic than that of the normal gland. The undermost peripheral layer of the growth was lobulated, white, and elastic, and separated from the adjacent structures by a thin, shining, fibrous capsule. Several large vessels were seen to penetrate its base, and to course especially towards its outer or fungoid portion.

The entire lower third of the tumour contained, in a vascular, sparse, delicate connective tissue, hyperplastic acini and ducts surrounded by their membrana propria. The acini were deformed, here and there confluent, and measured from five to sixty times their normal diameter. A few were converted into cysts, but the majority were closely packed with cells, the lowermost layer of which was columnar, while the superincumbent layers were round and had undergone fatty changes in the centre of some of the largest acini. In a few there were small vegetations made up of epithelium supported by young connective tissue. In addition to these features, excessively long, although only moderately wide, tubules pervaded the sections to such an extent that they greatly preponderated throughout the entire growth. Some were fusiform in shape, but the majority were irregular in their outline, being alternately contracted and dilated, like a row of ovoid beads. They pursued, as a rule, a parallel course, but they now and then divided and anastomosed with one another, and were not infrequently seen to be in direct communication with the altered acini, of which, indeed, they were merely prolongations, so that I counted nine offshoots from a single acinus, as at * Fig. 2, for which I am indebted to my friend Dr. Shakespeare. From an adjoining acinus, **, which is only partially represented, five ducts were given off, and one of these united with a duct which originated from acinus *. They were invested by columnar epithelium, and the majority preserved their lumen throughout, although they frequently terminated in attenuated solid cellular processes, which sometimes were turned upon themselves. The intertubular young connective tissue was so very scanty in quantity that, on transverse section, many of the closely crowded ducts appeared to be separated merely by their adventitia. There were also a few areas of normal dense fibrous tissue, into which the ducts were extending. Sections through the firmer portions of the fungus were so obscured by chronic inflammatory changes that little else was visible save cystic ducts and acini, while cuts through the skin near the ulcer disclosed that it was the seat of an extensive small-celled infiltrate.

From the foregoing minute features of cystic tubular adenoma, those of the case described by Billroth differed mainly in that the dilated acini were closely packed with delicate, partly vascular, connective tissue papillæ or vegetations clothed with cylindrical epithelium, and that from them were given off cellular cords, which looked like thrombosed lymph vessels, but which proved to be embryonic ducts, as indicated by a few being invested

Fig. 2.



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with columnar epithelium, and possessing a central canal. While in the cases of Morton and Langhans the ducts predominated, it appears that they were only forming and accessory in that of Billroth, as the vegetating cystic acini constituted the essential feature of the neoplasm.

It is thus to be perceived that adenomas may be acinous and tubular, and simple and cystic. Of the typical variety I can find no descriptions,

so that my account has to be drawn from fourteen cases, every one of which was cystic, eight having been the seat of atheromatous cysts, and six of ordinary fluid cysts, while, in addition, three of the entire number were characterized by microscopic intraäcinous vegetations.

The contents of the cysts may be fluid or semifluid, and are due to changes which take place in the proliferous epithelium. In the former event the secretion may be lactescent, as in the cases of Nancrede and Neumann; or sanguinolent, from the presence of vascular vegetations, as in one of the cases recorded by Labb   and Coyne;¹ or even without there being any very large vegetations, as in the example of Morton. When the cells have undergone advanced fatty changes, the contents are of a rather dense caseous nature, but the cavities are usually minute and never attain the volume of a walnut, as occurs when the contents are fluid. The size of the spaces rarely, indeed, exceeds that of a hazelnut; and the larger ones are usually formed by the confluence, or breaking down, of contiguous ones. When the cysts are vegetating, the lining epithelium proliferates in the form of papill  , which may be purely epithelial in their composition when they are small, or are made up of delicate vascular connective tissue, clad with columnar epithelium, when they fill the acini, as in the case of Billroth.

With the exception of cystic changes, adenoma does not appear to undergo other transformations, unless it be the telangiectatic, of which the case of Morton is a good illustration; or the myxomatous, as in a case of adenoma of the male mamma, recorded by Obolensky.² It is, moreover, not very liable to spontaneous ulceration, as that accident was only met with in the cases of Morton and Fochier; although it was threatened in one recorded by Labb   and Coyne.³ In another example, under the care of the latter observers,⁴ the tumour inflamed, ulcerated, and protruded fungous vegetations as a result of injections of phenic acid.

Adenomas are usually ovoid and invariably bosselated or nodulated in outline, but not largely so, and of a hard resistant consistence, although, when decidedly cystic, they may be uniformly soft and elastic, or, as more often happens, hard, excepting at the larger bosses over which they fluctuate. Although they are limited by a distinct fibrous capsule, they are, when of moderate volume, closely and broadly united to or incorporated with the mamma; but their attachment is less conspicuous as they increase in bulk. On section the cut surfaces are smooth, lobed, of a milky-white colour, with possibly rosaceous areas, and dotted with orifices or small cavities, which, after their contents have been expressed, impart to them a spongy, honeycomb, or sieve-like appearance. Now and then they are occupied by fluid cysts, which, however, rarely number more than three

¹ Op. cit., p. 343.

² Op. cit., p. 356.

³ Virchow-Hirsch's *Jahresbericht*, vol. i. p. 305.

⁴ Ibid., p. 352.

or four, are usually quite small, and rarely exceed the volume of a walnut. Their cut surfaces are never pervaded by fissures or slits, nor are they the seat of dilated ducts with intracanalicular solid growths, as are witnessed in the connective tissue neoplasms; nor of yellowish lines or spots, such as are seen in carcinoma.

They are never multiple, and originate usually toward the upper and inner periphery of the breast, being found either beneath or in the vicinity of the nipple in only one-third of all instances. They develop as early as the nineteenth and as late as the fifty-ninth year, the average age of their first observation being thirty-five years. Of the fourteen examples

	1	appeared between 10 and 20 years.
3	"	" 20 " 30 "
5	"	" 30 " 40 "
4	"	" 40 " 50 "
1	"	" 50 " 60 "

Of the entire number not a single one occurred before the sixteenth year, or during the developmental state of the mamma; six, or 42.85 per cent. appeared previous to the thirty-fifth year, or during the period of the functional activity of the breast; and eight, or 57.14 per cent., after that age, or during the functional decline of the mamma.

Nine of the patients were married when the tumour was first detected; two were single, and in three the social condition was not stated. Of the married women, five were prolific, two had one child, and one was barren; and the question of children was not mentioned in one. In none did the tumour originate during lactation. The menstrual discharge was regular in all the cases in which that function was noted. In not a single instance was the disease traceable to injury or hereditary influence; but in one¹ it was preceded by eczema of, and a milky discharge by, the nipple, on the removal of the crusts, which had, however, ceased for nine years, and in another by mammary abscess.² The general health of the subjects was excellent.

The increase of adenomas is, upon the whole, less rapid than that of any other of the neoplasms of the breast, and is not influenced by lactation, pregnancy, or uterine disorders. In the case under my own care the tumour attained the volume of a walnut in three years. In one recorded by Langhans,³ it reached a size which equalled the palm of a hand in nine years, although it may grow as large as a hen's egg in six⁴ or twelve months.⁵ Certain writers state that it does not exceed the latter volume, but it may reach the dimensions of a fist in two,⁶ fifteen,⁷ or thirty-six years,⁸ or of a

¹ Labb  et Coyne, op. cit., p. 356.

² Case of Nanerede.

³ Virchow's Archiv, vol. lviii. p. 147.

⁴ Labb  et Coyne, loc. cit.

⁵ Billroth, Langenbeck's Archiv, vol. vii. p. 861.

⁶ Case of Neumann.

⁷ Labb  et Coyne, op. cit., p. 352.

⁸ Ibid., p. 343.

child's head in ten months,¹ twenty-three months² or eighteen years.³ Hence the rate of growth is very variable, but the mode of growth is peculiar in being equable and uninterrupted, and, as a rule, so slow that many years may elapse before the tumour attains even a moderate bulk. Thus in the cases of Morton, and in one of Labb  's, it was scarcely appreciable for respectively seven and ten years, while in another of Labb  's, the increase was so excessively slow that the almond-sized nodule required thirty-three years to reach the volume of an egg, after which it took a more rapid growth so that in three years it equalled the dimensions of a fist. The mode of increase appears also to be singular in that it goes on by the apposition of new nodules to the original tubers, which is due to the successive involvement of contiguous lobules, through which the entire mamma may finally be converted into a bosselated tumour.

After they have existed for some time, they evince certain signs, which, if they are not carefully studied, render them liable to be confounded with carcinoma. Although the subcutaneous veins are prominent in only one case out of every twelve,⁴ the skin is discoloured in one out of every three, and it is adherent in one out of every two. The nipple is deformed or sunken, rather than retracted, in one example out of every six, and a bloody or lactescent discharge by that body precedes the detection of the tumour in one case out of every four. Ulceration occurs late in the disease in one instance out of every three, and in one-half of these a red, vegetating, and bleeding fungus protrudes through, but is unattached to the margins of, the opening, and may be cast off piecemeal. In the remaining half there is merely a sanious, and, possibly, a fetid discharge. Caseous degeneration or enlargement from irritative hyperplasia of the axillary lymphatic glands is met with in one case out of every six. In 63.63 per cent. of all instances there is absolute freedom from pain; in 9 per cent. the suffering is moderate, while in 27.27 per cent. the pain is severe and lancinating, especially when the growth has been rapid.

Our knowledge of the prognosis of adenomas is unsatisfactory. In one of Foehier's patients, the parts were perfectly sound six months after operation. One patient remained well for two years after the enucleation of a tubular adenoma, but there were several large and hard lobules in the vicinity of the cicatrice.⁵ In one of Labb  's cases⁶ there was local recurrence and enlargement of the axillary glands in less than twelve months, and death ensued at the expiration of three years after the removal of the entire breast, but there does not appear to have been a post-mortem inspection of the body. The disease recurred in the cicatrice in seven

¹ Case of Fochier.

² Billroth, Langenbeck's Archiv, vol. vii. p. 860.

³ Case of Morton.

⁴ The histories are complete in only twelve cases.

⁵ Langenbeck's Archiv, vol. vii. p. 861, and Chir. Klinik, Zurich, p. 256.

⁶ Op. cit. 352.

months after total extirpation of the mamma of the patient of Steudener, but she was well thirty-one months after its removal. Of the remaining ten, two are entirely devoid of a history of the termination, while five recovered from operation, and three died, one of lung complications, one of erysipelas, and one of septicæmia. Duplay¹ and Deffaux² state that adenomas frequently recur, and the cases in which the histories extend over a sufficiently long period after operation demonstrate that recurrence is the rule. They exhibit no tendency, however, to infect distant organs, and their benign nature is shown by the fact that they had existed, on an average, nine years before extirpation, without affecting the general health. One case, indeed, was of nine, one of fifteen, one of eighteen, and one of thirty-six years' standing.

A small adenoma is very liable to be mistaken for a small fibroma, but the latter is more distinctly circumscribed and isolable, and far more mobile in or upon the mamma, and its outline is not so decidedly bosseated. Upon the whole, the diagnosis of adenoma is based upon its hard and heavy feel, its nodular configuration, its pretty intimate attachment to the breast when of moderate volume, its slow and equable growth, its increase by the addition of small, compact nodules, its occurrence in married women towards the thirty-fifth year, the limited discoloration and adhesion of the skin and ulceration late in the disease, and freedom from retraction of the nipple, enlargement of the subcutaneous veins, attachment to the chest, and involvement of the lymphatic glands. If a tumour, which presents these features has been preceded by a discharge by the nipple, there should be little difficulty in arriving at a correct conclusion as to its true nature.

PHILA., 1112 WALNUT St., August, 1879.

ARTICLE XIII.

A CASE OF RUPTURED WOMB, FOLLOWED BY ABSCESS, AND ULTIMATE RECOVERY. By B. M. BADGER, M.D., of Wright's Bluff, South Carolina.

THE subject of this accident, Melinia R., is a stout negress, aged 32 or 34; eleventh pregnancy. I was called to see her at 10 o'clock A. M., April 11, 1879; labour had been in progress about forty hours. Her condition at the time of my arrival was one of extreme exhaustion, pulse weak and frequent, facies anxious. She had been vomiting for some time, the matters discharged, however, were only the gastric ingesta.

The whole appearance of the woman was one of great physical suffering. She complained of severe abdominal pain, referred more especially to the epigastrium; this localization of her pains being very marked and distressing.

¹ Op. cit., p. 638.

² Op. cit., p. 40.

A hasty and superficial examination of the abdomen revealed a very prominent tumour occupying the hypogastrium; furthermore a vaginal examination revealed a case of shoulder presentation, with protrusion of right hand and arm livid and much swollen.

The woman was nearly moribund, but I appreciated the fact that there was not a moment to lose, and I determined to do the best I could, unaided as I was, although an apparently hopeless task was before me.

Having chloroformed the patient, I proceeded at once to introduce my hand, grasp the feet, turn, and deliver, which was accomplished with much less difficulty than I have at other times encountered in cases of shoulder presentation. The child was dead, and had, to all appearances, been so for several hours.

It may here be remarked, parenthetically, that up to this time there had nothing transpired to lead me to *know* that I had a case of ruptured womb to deal with, as, upon my arrival, recognizing the imperative necessity for immediate interference, I did not lose any time in prosecuting an investigation that could only have resulted in a criminal delay, and besides there had as yet been presented no unequivocal signs of such a catastrophe.

After resting a few moments, the woman in the mean while having rallied from the effects of the anaesthetic, I introduced the hand to bring down the placenta; my fingers came in contact with the mouth of the womb, but neither funis nor placenta was discoverable within. The horrible withering truth now instantly flashed upon me; and it was but an act of intuition to grasp with the other hand the hypogastric tumour, and discover, by conjoined manipulation, that I held between the two a firmly contracted empty womb. I withdrew the hand, and, seizing the cord, following it as a guide through the rent, discovered the placenta somewhere in the vicinity of the stomach: the hand before reaching the object of its pursuit, coming in contact with the mesenteric folds, small intestines, etc., which were pushed aside.

The rent was so large as to occasion no appreciable constriction, and seemed nearly to sever the neck from the body of the womb, occupying the entire front of the cervico-corporeal juncture. The hemorrhage (external) was insignificant, nothing to compare to ordinary cases of natural labour, a fact which much puzzled the two midwives present, from whom I elicited the following: That about nine o'clock the day before, while the woman was endeavouring to relieve her bladder, there was a sudden gush of water (amniotic) preceded immediately by a sensation as if something had burst, and so distinct was this impression that the woman insisted that the child had escaped into the chamber vessel on which she was then sitting; upon being assisted to bed, it was discovered that an arm of the child had presented. Repeated, but futile, efforts were made to restore the arm, vainly temporizing, hoping, we suppose, for spontaneous evolution, or, as they expressed it, that "things would come right after a while." The result was a criminal delay of twenty-four hours.

The binder applied, she was put to bed, feeling as comfortable as could have been expected; her friends being informed as to the serious nature of the case, and utter unlikelihood of her recovery.

Large doses of opium given to relieve the severe and persistent epigastric pain, and continued *pro re nata*, to restrain all peristalsis.

16th, five days after delivery ; stomach irritable, abdomen enormously tympanitic, and very tender on pressure ; skin hot ; pulse 130 ; vaginal discharge very scanty ; bowels moved once by an enema ; bladder emptied spontaneously ; patient conscious, but anxious and extremely restless.

Opium continued as before, in conjunction with turpentine stupes, it also being administered internally ; diet as nourishing as possible.

From this date there was a slow but steady amelioration of all symptoms, and, on the 23d, the patient was bright and cheerful. Skin moist and cool ; pulse 116 ; abdomen much reduced, some tenderness on pressure. I here discovered that there was some induration just below the umbilicus. Very little change in treatment. Whiskey and milk-punch ordered.

The tumour-like hardness below the navel for several days continued to occasion great and increased suffering, and, as there was now no doubt as to its nature, poultices were applied, and, on May 5th, a large abscess had pointed just two inches below the umbilicus. Plunging a bistoury into this, and enlarging the opening to about an inch as I withdrew it, there escaped about sixty-four ounces of horribly offensive pus. From this time her improvement was uninterrupted, and, on the 19th, I found her doing some light work in the garden.

June 5. Made an examination ; the orifice of the abscess entirely closed. A distinct band of adhesion (the nidus of the old abscess) running from this point to the fundus of the womb, which, through the flaccid walls of the abdomen, can be felt about two inches in diameter and three or four in length ; it allows rough handling, and so firmly adherent to the womb as to convey the idea of an elongation of that viscus ; and, grasping which with the left hand, and using it as a lever, I was greatly aided in bringing the os within the speculum.

There appeared to be no other adhesions, as the womb was extremely mobile otherwise. A good light enabled me to see that the rent had entirely healed ; effectually and to all appearances hermetically closing the mouth of the womb. I did not attempt to introduce a probe, but am disposed to regard the os as being impervious, inasmuch as the woman states that her menses usually returned within six weeks from the birth of a dead child, and up to this writing, June 24th, she has seen no signs whatever.

REVIEWS.

ART. XIV.—*National Public Health Legislation.*

1. *Reports and Resolutions relating to Sanitary Legislation. Presented to the American Public Health Association at its meeting in Richmond, Va., November, 1878.* 8vo. pp. 23. Cambridge, 1878.
2. *A Bill to Establish a Department of Public Health,* offered by Mr. LAMAR, Dec. 10, 1878 (S. 1462), 45th Congress, 3d session.
3. *Memorandum of the American Public Health Association on Legislation Affecting Public Health.*
4. *Proceedings of the Board of Experts authorized by Congress to investigate the Yellow Fever Epidemic of 1878, meeting held in Memphis, Tenn., Dec. 26, 27, 28, 1878.* 8vo. pp. 21. New Orleans, 1878.
5. *Circulars of the National Board of Health, Washington, D. C.* 8vo., Nos. 1, 2, and 3. April 7, 1879.
6. *National Board of Health Bulletin.* Nos. 1–7, 1879.

TITLE LVIII. of the Revised Statutes of the United States, issued in 1875, is headed “The Public Health,” and contains nine sections. The first of these directs that State quarantine and other health laws shall be observed by officers of the revenue and military services of the United States. It would seem that naval officers are not under such obligation, and it is difficult to conceive of any good reason for this exception.

The next four sections relate to details of custom-house work in connection with State quarantine establishments, the most important one being the following :—

“There shall be purchased or erected under the orders of the President, suitable warehouses, with wharves and inclosures, where merchandise may be unladen and deposited from any vessel which shall be subject to a quarantine, or other restraint, pursuant to the health laws of any State, at such convenient places therein as the safety of the public revenue and the observance of such health laws may require.” (Sec. 4794.)

The remaining sections relate to the removal of revenue officers from ports, and of public offices from the capitol, the adjournment of courts, and the removal of prisoners, in case of the prevalence of a contagious or epidemic disease.

Evidently Congress had given very little attention to the public health prior to 1875. It should be noted, however, that in the winter of 1873–4, a strong effort was made in Congress to pass a quarantine act at the instance of Mr. Bromberg, representative from Alabama, and the discussion of the subject which then occurred, no doubt had much value as an educational measure. Within the last year a marked change has occurred in the situation, and the purpose of this article is to give an account of this change; and to furnish data for an intelligent opinion upon a question which has been indirectly submitted by Congress to the medical profession

and sanitarians of the United States for decision, viz., What is the best plan for a national public health organization including a national system of quarantine?

Just at the close of the yellow fever epidemic of 1878, came the meeting of the American Public Health Association, at Richmond, Nov. 19-22. To this meeting came all the leading and professional sanitarians of the country, and also many physicians and laymen who had been in the midst of the epidemic and could present the most vivid pictures of the desolation and suffering which it had caused.

It was supposed that the report of the Yellow Fever Commission would be presented at this meeting, and that the Association, after due deliberation, would give an opinion as to what should be done, but it was found that the report was not ready, and, indeed, it was unreasonable to suppose that it could have been prepared in the time allowed.

The Association therefore had before it little or no evidence as to the nature of the cause of yellow fever, and it adopted certain propositions, not as deliberate and final conclusions, but as merely indicating the prevailing opinion of those present.

These propositions were as follows:—

1. Yellow fever is a specific disease, and its appearance in the United States in 1878 was due to the importation of the specific cause.

2. Quarantine established with such rigor and precision as to produce absolute non-intercourse, will prevent the importation of the specific cause of yellow fever.

3. It is the duty of the General Government to aid in the establishment of a practical and proper quarantine by all means in its power.

4. It is the duty of the General Government to appoint a commission of experts to make a thorough investigation into the causes of yellow fever, and the best methods of preventing its introduction into this country, and to make such an appropriation as will permit of securing the services of the best men and of the best means for carrying out such investigation.

5. It is the duty of the General Government to invite foreign nations to co-operate with it in the establishment of uniform and effective international quarantine regulations.

6. Whatever may be the practical value of quarantine, there is no doubt of the importance and value of internal sanitary measures in the prevention or modification of epidemic yellow fever, and this Association strongly urges upon State and municipal authorities the great amount of responsibility which rests upon them on this account at times when no disease is prevalent or threatening.

Although these resolutions met with some objection and criticism from both the medical and secular press, they represent very fairly the prevailing public opinion of the time, and the influence of this opinion was at once apparent on the meeting of Congress in the following December. Special Committees on Epidemic Diseases were at once formed in both House and Senate, and the fact that such committees were found necessary is sufficient evidence of the slight degree of attention which had previously been given to the subject of public health by Congress, there being no standing committee to which such questions as were now of prime interest could with propriety be referred. Upon the recommendation of these committees a commission composed of members and senators assisted by twelve experts was formed, and proceeded to visit Memphis, New Orleans, and other points at which the disease had prevailed, and collect

the opinions of physicians in those cities as to the nature and cause of yellow fever, and as to what should be done by Congress in the premises.

Several bills were also introduced without waiting for the report of the commission, of which bills, the one presented in the Senate by Mr. Lamar, of Mississippi, on Dec. 10, 1878, attracted most attention and roused a strong opposition.

This bill created a Department of Public Health with a Director-General at its head, who was to perform also the duties of the Supervising Surgeon-General of the Marine Hospital Service, or, in other words, it converted the Marine Hospital Service into a department of public health for the United States.¹

The duties of the Director-General of Health were defined to be as follows, viz., to make and enforce all quarantine and other regulations for the prevention of cholera or yellow fever and other epidemic diseases in the United States, and whenever cholera or yellow fever might appear in any locality, and information thereof should be brought to the knowledge of said officer, he was to prepare and carry into effect such rules and regulations as in his judgment would, with the least inconvenience to commerce and travel, prevent the spread of the disease.

He was to select suitable localities for establishing quarantine stations, erect buildings and enforce such transhipment of passengers, baggage, and cargoes, as he might deem necessary. The Director-General was also to do divers and sundry other things, but the autocratic power sought to be conferred on the Supervising Surgeon of the Marine Hospital Service, by the clauses just referred to, was very distasteful to the leading sanitarians of the country, and especially to those connected with State and Municipal Boards of Health. The views of these gentlemen were expressed in the action taken by the executive and advisory committees of the American Public Health Association, and published in January, 1879.² This memorandum set forth:—

"That in view of the great diversity of opinion among those who attempt to judge as to methods of quarantine, and especially as to the relations which should exist between national and local systems of quarantine; of the fact that we have not as yet sufficient information to enable us to formulate any system of national quarantine which might not do more harm than good; and of our belief that there is a possibility of recurrence of yellow fever in the United States during the coming summer from causes which may have survived from last summer, and which, therefore, cannot be prevented by any system of national quarantine alone; we believe that any legislation, until further investigation has been made with regard to a national quarantine, either to provide a new law or to amend or enforce the present one, will be inexpedient and unwise."

The memorandum then goes on to advise the organization of a provisional National Health Commission, which should be in no manner dependent upon or be connected with any existing bureau or department of the government. Omitting, for the present, further summary of this memorandum, which is a very important document in the history of public

¹ The Marine Hospital Service has no connection with the Navy Department as the name might seem to imply; it is a branch of the Treasury Department established to care for sick seamen of American vessels engaged in commerce, including steamboat hands in the interior waters. The funds for doing this are derived from a tax on each seaman of fifty cents per month, which is levied by the United States Collectors of Customs, and it is for this reason that the business is under the control of the Treasury Department.

² Memorandum of the American Public Health Association on legislation affecting the public health. 4 pp. 8vo.

health legislation in this country, we merely note that strong objection was made by some physicians in the South to the statement as to the possibility of recurrence of the disease from causes already in the country, but the result has fully proved the wisdom of the warning.

In the meantime the Board of Experts appointed by Congress had visited the South and taken testimony, and at the end of January, 1879, presented its conclusions to Congress. These conclusions, so far as they related to legislation, may be summed up as recommending the following provisions:—

- 1st. The formation of a chief health authority at Washington.
- 2d. Stationing medical officers at foreign ports to report as to condition of vessels bound for the United States.
- 3d. Establishment of quarantine.
- 4th. Local sanitation, isolation, etc.

Having received this report, the Senate Committee on Epidemics, on February 7, 1879, submitted through its chairman, Senator Harris, of Tennessee, a bill to prevent the introduction of contagious or infectious diseases into the United States, and to establish a Bureau of Public Health. This bill was narrower in its scope than the Lamar bill, since it created a Board of Health which had no duties other than those relating to quarantine, and it retained the feature of making the Marine Hospital Service the Bureau of Public Health.

The opposition to this was nearly as strong as to the Lamar bill, and, indeed, stronger on the part of sanitarians, since it reduced the question of the public health to a mere matter of quarantine, and entirely ignored questions of municipal cleanliness.

The bill passed the Senate, however, but failed to pass the House. In lieu of it, in the last hours of the session, a bill, introduced by Mr. McGowan, of Michigan, passed the House and Senate, and was approved March 3d, 1879, under the title of "An Act to prevent the introduction of infectious and contagious diseases into the United States, and to establish a National Board of Health." This we shall in future speak of as the Constituting Act.

This Act may be considered as the true beginning of National Public Health Legislation in the United States, and as being the foundation upon which we are to build; and the preceding account of some of the circumstances and influences which led to its passage has been given to enable the reader to rightly appreciate certain crudities and imperfections in the Act, and also that he may understand the strong differences of opinion as to its merits.

It was hastily drawn, and passed in the last hours of the session, without discussion, as being the best that could be done at that time; and under such circumstances it is surprising that its provisions should be so generally satisfactory as they have proved to be.

It creates a National Board of Health to consist of seven members to be appointed by the President, and of one medical officer of the Army, one medical officer of the Navy, one medical officer of the Marine-Hospital Service, and one officer of the Department of Justice, to be detailed by the chiefs of their respective departments.

The Board is to frame its own rules and regulations, and select its own officers, and its duties are defined to be:—

"To obtain information upon all matters affecting the public health, to advise the several departments of the Government, the executives of the several States, and the commissioners of the District of Columbia, on all questions submitted by

them, or whenever in the opinion of the Board such advice may tend to the preservation and improvement of the public health."

It is also directed to consult with the Academy of Sciences and with the principal sanitary organizations and the sanitarians of the States and the United States, and after such consultation to report a plan for a National Public Health Organization.

Owing to delay in the appointments, the Board was not organized until April 2d, 1879. In the mean time an extra session of Congress had been convened on the 18th of March, and a bill for a National Quarantine had been introduced, which in many respects was identical with the one introduced by Senator Harris during the previous session as above referred to.

As soon as the National Board of Health was fairly organized this bill was referred to it for comment, and was returned by it with suggestions as to additions and alterations which were only in part accepted by Congress. This was to be expected, since the views of physicians and sanitarians are by no means taken from the same standpoint as those of lawyers and legislators.

The feeling of the Board, as shown in its communication to the Committee, was averse to assuming any special authority over quarantine matters, if for no other reason than that it had not yet obtained the necessary information to enable it to act promptly and decidedly.

On the other hand, the representatives of constituencies in the Southwest, which had suffered from the epidemic of the previous year, were very strongly impressed with the inefficiency of State and local quarantine measures, and with the desirability of having some central power which should make quarantine uniform and efficient.

The ground taken by those specially in charge of the bill was that Congress could legislate on public health only through its power to regulate commerce, and therefore that its legislation must be confined to quarantine. The result was the passage of the Act approved June 2d, 1879, which we may entitle the Quarantine Act.

It was by no means easy at first to understand what duties and powers were actually conferred on the National Board of Health by this Act. Probably the great majority of the people, and indeed of Congress, supposed that it gave the National Board very great powers of interference with State and local organizations so far as quarantine is concerned; that the Board could stop boats or trains, depopulate towns, arrest persons defying its authority, etc. etc. Many persons also supposed that it empowered the Board to make rules and regulations by which State and municipal boards should be governed.

The truth is that the only power given to the Board, so far as interference with State and local boards is concerned, is given by the following paragraph of the law, viz:—

"SEC. 3. That the National Board of Health shall co-operate with and, so far as it lawfully may, aid State and municipal boards of health in the execution and enforcement of the rules and regulations of such boards to prevent the introduction of contagious or infectious diseases into the United States from foreign countries, and into one State from another; and at such ports and places within the United States as have no quarantine regulations under State authority where such regulations are, in the opinion of the National Board of Health, necessary to prevent the introduction of contagious or infectious diseases into the United States from foreign countries, or into one State from another; and at such ports and places within the United States where quarantine regulations exist under the authority of the State, which, in the opinion of the National Board of Health, are

not sufficient to prevent the introduction of such diseases into the United States, or into one State from another, the National Board of Health shall report the facts to the President of the United States, who shall, if, in his judgment, it is necessary and proper, order said Board of Health to make such additional rules and regulations as are necessary to prevent the introduction of such diseases into the United States from foreign countries, or into one State from another, which, when so made and approved by the President, shall be promulgated by the National Board of Health and enforced by the sanitary authorities of the States, where the State authorities will undertake to execute and enforce them; but if the State authorities shall fail or refuse to enforce said rules and regulations the President may detail an officer or appoint a proper person for that purpose.

"The Board of Health shall make such rules and regulations as are authorized by the laws of the United States and necessary to be observed by vessels at the port of departure and on the voyage where such vessels sail from any foreign port or place at which contagious or infectious disease exists, to any port or place in the United States, to secure the best sanitary condition of such vessel, her cargo, passengers, and crew, and when said rules and regulations have been approved by the President they shall be published and communicated to, and enforced by, the consular officers of the United States; *Provided*, That none of the penalties herein imposed shall attach to any vessel or any owner or officer thereof, till the act and the rules and regulations made in pursuance thereof shall have been officially promulgated for at least ten days in the port from which said vessel sailed."

The only rules and regulations which the Board could make, therefore, were those to be observed by vessels at foreign ports of departure where contagious or infectious disease exists, or on the voyage from such ports.

Under these circumstances the Board called into its counsels the quarantine officers of some of the principal seaports of the country, and in accordance with their suggestions, and more especially those of Dr. S. O. Vanderpoel, the quarantine officer of the port of New York, prepared a set of rules and regulations for securing the best sanitary condition of vessels, including their cargoes, passengers, and crews, coming to the United States from any foreign port where any contagious or infectious disease might exist.

These regulations were approved by the President on the 26th of June, 1879. Under these rules the following diseases are recognized as contagious or infectious: Asiatic cholera, yellow fever, plague, smallpox, and typhus fever; and an infected port or place, in the sense of the rules, is a port or place at which either Asiatic cholera, yellow fever, or plague exists, or at which either smallpox or typhus fever exists as an epidemic.

These rules and regulations in the main accord with those reported by the Special Committee on Quarantine to the Fourth National Sanitary and Quarantine Convention, which met in Boston in 1860, which in their turn were copied from the regulations for quarantine adopted in the convention between France, Sardinia, and certain of the Mediterranean powers, and issued in 1853.

Besides these rules and regulations, properly so called, the Board issued a circular to State and municipal health authorities, containing recommendations for "Rules and Regulations to be adopted and observed at all ports in the United States, which are or may be designated as quarantine stations," and also to secure the best sanitary condition of steamboats and other vessels going from any port of the United States where yellow fever exists to any other port or ports in the United States, and to secure the best sanitary condition of railroads, including their station-houses, etc., connecting with any port where yellow fever exists; also regulations to be observed and enforced by the health authorities of a place free from infection but having communication with a place dangerously infected with yellow fever, and those to be adopted in the infected town or place itself.

The rules and regulations recommended in this circular are often spoken of as the Rules and Regulations of the National Board of Health, but they are not really rules and regulations, in the legal sense of the word, until they have been adopted by some body which has the power to enforce them, such as a State or city, in which case they become the rules and regulations of the enforcing body.

These recommendations had just been agreed upon, and the printing of them had not been fairly completed, when an outbreak of yellow fever in Memphis was announced on the 9th of July, which was soon followed by a similar announcement from New Orleans.

Under this stimulus the State and local boards of the southwest, as a rule, accepted the recommendations of the National Board with great promptness, and set to work to limit, if possible, the spread of the disease. The time between the passage of the law and the outbreak in Memphis was much too short to permit of any satisfactory organization. The condition of Memphis itself was very peculiar; it had given up its charter as a city, and was changed into a county taxing district, which was in the hands of two receivers, the one State and the other national. A special commissioner was appointed by the State for the government of the taxing district, and a tax law was passed permitting the collection of funds for certain specific purposes only, and in very limited amounts.

This act did not take effect until so late in the season that the local authorities were unable to obtain means with which to put the city in a good sanitary condition, or to accumulate materials for use in case of the outbreak of an epidemic.

Through the exertions of a voluntary association of citizens of Memphis the streets and alleys had been made reasonably clean, that is, so far as this could be done without removing the great quantity of rotten wooden pavement which exists in that city; but nothing was done to change the privy system, which is one of pits, emptied at irregular intervals and without method, the pits varying in depth from six to twenty-five feet. The result was that the outbreak of the disease found Memphis totally unprepared to meet it; the more so as it had been hoped that the preceding unusually severe winter had destroyed all germs of the disease existing in the city, and that its only danger would be from a fresh importation. Some confusion and delay occurred from the failure of the State and local boards to appreciate the fact that the main part of the work to be done depended on themselves, and not on the National Board; and some delay also occurred on the part of the Treasury Department, as to the proper mode of construction of the law, and as to its duty in approving the estimates and requisitions forwarded by the Board; but the conclusion of one of its prominent officials, that although all this must be considered as sentimental legislation and a waste of money it would, nevertheless, be as well not to oppose it, finally prevailed.

It is not the purpose of this paper to record the operations of the Board, or the progress of yellow fever during the summer of 1879. All this will be found duly set forth in the Bulletin, a weekly publication of the Board, authorized by law, the first number of which was issued June 28, 1879.

The questions to be answered during the autumn and coming winter by physicians and sanitarians, by the National Board, by the Academy of Sciences, and by Congress are:—

1st. Is the present constitution of, and legislation affecting, the National Board of Health satisfactory?

2d. If it be not satisfactory, what changes should be made? since, with the readers of this Journal, we may assume without argument the desirability of a National Public Health organization of some sort.

The principal difficulties which have been met with by the Board in the outset of its career, giving rise to some rather bitter criticisms on the part of the public press, appear to have been due to several causes. The first is the difficulty in moving promptly and decidedly which a board almost always evinces as compared with an individual. A board is rarely unanimous at first; it discusses, and doubts, and hesitates, and thus sometimes loses the golden opportunity.

The second difficulty is, that the great body of the public has taken comparatively little interest in the National Board or in public hygiene, and is in almost total ignorance of the whole subject.

The general impression in many quarters was, at first, that the Board was created to prevent the occurrence of yellow fever in the United States; that it had been given ample powers and means to do this, and if yellow fever broke out—as it did—it proved the inability and inefficiency of the Board. The feeling of many persons was expressed in the query of a prominent official who demanded loudly, “Why don’t the Board proceed at once to Memphis, and take the fell destroyer by the throat?”

While skilled sanitarians will smile at the ignorance betrayed by this question, it must be remembered that such a man represents a very large constituency, and until he, and those like him, are better informed about the possibilities of public hygiene, and the methods which should be used to prevent disease, no National Public Health organization can be said to rest on a secure and permanent foundation. Many physicians, even, cannot see why the Board did not do something striking, and calculated to meet the popular demand. Why, for instance, it did not cause each case of yellow fever to be isolated thoroughly, all infected clothing, bedding, and buildings to be destroyed, or satisfactorily disinfected, and all persons liable to the disease in an infected town compelled to move into a camp of observation, etc. It may be worth while to comment a little on these points.

In the first place, the earlier cases of disease will not usually be made known to the Board. In many cases they will not even be recognized by the physicians who see them, for it is extremely difficult sometimes to distinguish a case of yellow fever, but, even when they are recognized, the local influences are all against their being reported. He is a bold physician who, in New Orleans, would report publicly a case of yellow fever in June or during the first half of July, and he may be sure that his diagnosis will be promptly contested.

In the second place, the National Board of Health had no power to isolate or disinfect, or to remove people from their homes; even States and cities have this power to but a limited degree, and must pay for all damages caused by its exercise. But the National Board has no such power, and had it tried to assume it it would almost at once have found itself in conflict with State and municipal laws, and have aroused the hostility of State and municipal health authorities, the very organizations with which it was of the utmost importance it should be on friendly terms in order to satisfactorily render the aid and co-operation prescribed by the law.

The only powers possessed by the National Board lay, first, in the character and reputation of its members, and the probability that their

advice would be received with respect by local organizations; and, second, in the fact that \$500,000 had been given to it by Congress to enable it to aid and co-operate with such authorities, and that the desire of States and cities to obtain a portion of this money would induce them to consult the wishes of the Board independent of any weight which they might give to its advice as coming from a body of scientific men.

One of the first questions to be settled is as to whether it is desirable that the National Public Health Organization should possess any more power, in the legal sense of the term, than it has now.

Setting aside all questions connected with the constitutionality of giving it authority to interfere with State or municipal authorities, or with travel and traffic, and supposing it were perfectly legitimate to give it power to close a port or to isolate a house, would it be expedient to do so? Is it not best for the cause of preventive medicine that our National Public Health Organization shall for the present be mainly concerned with collecting information, giving advice, and stimulating the work of State and local boards of health by precept, by example, and by a certain amount of pecuniary aid?

If the answer to this be in the affirmative then the present organization of a board is much to be preferred to having a single minister or director-general of health.

If greater executive powers are to be given to the Board, they should be conferred on an officer selected by the Board.

With regard to the constitution of the Board, and especially as to the number of persons to compose it, it should be remembered on the one hand that the larger the Board the more expensive it is, but, on the other hand, that it is also desirable that each State should be represented in it.

To the members of the medical profession of the United States the question as to whether the present National Public Health Organization of the country shall be preserved and improved, or be abandoned and broken up by Congress, is not one of mere theoretic interest in which they need take little concern.

It is their duty to make themselves, at all events, sufficiently familiar with the subject to be able to give an intelligent opinion to their representatives in Congress as to what legislation is really desirable upon this subject at the present time, and to estimate at their true value the efforts which have been and will be made to induce Congress to abolish the National Board of Health on the plea of economy, and to transfer its duties to some department or person who will undertake to perform them more cheaply.

There will not be the slightest difficulty in finding the person or department willing to undertake this, or, for that matter, any other branch of Government work, even that of Congress itself, at much less than the present cost, but will the work be as well done?

J. S. B.

ART. XV.—*Lessons in Gynecology.* By WILLIAM GOODELL, A.M., M.D., Physician-in-Charge of the Preston Retreat, Professor of Clinical Gynecology in the University of Pennsylvania, etc. 8vo. pp. 380. Philadelphia: D. G. Brinton, 1879.

DR. GOODELL dedicates this neatly bound volume of nearly 400 pages to Dr. S. Weir Mitchell, "as a token of friendship and esteem." A parent may give his child such name as he pleases, even though that name should be Beelzebub or Maud! We cannot, therefore, quarrel with Dr. Goodell for naming this promising child of his brain *Lessons*, though really most of these lessons would, in our opinion, be more appropriately called *Clinical Lectures*. We do not believe *Lessons* was selected from any affectation, but from sincere modesty as well as from a desire to indicate the elementary character of much of the instruction given.

The volume contains twenty-nine lessons, but before considering any of these in detail, we wait for a moment to refer to the author's style. It is a real pleasure to read whatever Dr. Goodell writes. In the preface to this volume the author states he has "a slow pen." And yet he has attained such perfection of art in composition that this slowness of pen is not manifest by any artificial construction of sentences, by any stiff and constrained utterances, but his words seem to flow easily, gracefully, clearly, like waters from a pure, exhaustless fountain. There is nothing superfluous in a sentence, no pleonasms; and yet, on the other hand, the thought is never clouded by the concise expression of it; the author's meaning is as clear as crystal. He is at home in other than professional fields of literature, and occasionally brings thence some valuable ornament or striking illustration. Possibly we would not be far wrong in partly attributing the excellent style he has made for himself, to reading and study of the Bible. We remember seeing it stated by at least one writer upon rhetoric that the three volumes first in importance for the student who would acquire a good style are the Bible, Shakespeare, and Paradise Lost. But, from whatever sources derived, with what long and weary effort attained, Dr. Goodell's style is a never-failing excellence, and gives a charm to whatever he writes.

The first of the lessons is upon Gynecological Instruments. It occupies eight pages and illustrations are given of the author's speculum and his examining table. The second lesson is upon Caruncle and other Affections of the Female Urethra. An illustration and description of Paquelin's thermo-cautery are given. The illustration is similar to that given by LeBlond,¹ but we miss several of the cauteries represented by the French author.

The third lesson concerns Vesical Disorders of Women. These by their frequency and some by their obstinacy, vex the physician, sometimes almost as much as the patients, and any light shed upon their nature and treatment is eagerly accepted by him. Dr. Goodell's lesson contains much valuable knowledge, many useful instructions. In referring to a certain variety of frequent and painful micturition, the author remarks—and we give the passage as an illustration of his power to say much in little, and to say it clearly:—

¹ *Traité Elementaire de Chirurgie Gynécologique*, Paris, 1878.

"The bladder is hysterical, if you choose so to label it, and the motto of an hysterical bladder, as regards local treatment, should read, *noli me tangere*."

In considering the treatment of vesical calculus, he remarks:—

"The operation of vaginal lithotomy in the female is, however, so easy and so safe a one that it would, in the vast majority of cases, be far better to extract the stone by incision than by crushing."

We cannot accept this statement. On the contrary, we believe that it should run thus, in the vast majority of cases it would be far better to extract the stone by crushing and dilatation than by incision. In the first place, these calculi usually consist of phosphate of lime or phosphate of magnesia and ammonia, are quite soft and are very easily crushed. Then take, for example, eleven cases of lithotripsy in the practice of Civiale and nine in the hands of other surgeons, every one recovering, and contrast the result with eleven cases, as given by Hybord,¹ of extraction of the stone through the vesico-vaginal wall, nine recovering and two dying,² and surely we cannot give such unqualified indorsement of lithotomy as Dr. Goodell. We believe, as stated by Hybord, it ought to be reserved for cases where the stone is both large and hard, or is encysted, or is associated with calcareous concretions upon the vesical wall.

The fourth lesson is upon Fistulae of the Female Genital Organs. On p. 44 of this lesson there is an excellent illustration, modified from Beigel, of these different fistulae, and on p. 46, with other instruments, some five different knives are represented, but not one pair of scissors, though these are probably better and more generally used in operating than any or all scalpels.

The fifth lesson, Closure of the Vulva for Incurable Vesico-vaginal Fistula; Tumours of the Vulva, contains under each topic a most interesting case. The first of the cases is one where closure of the vulva with opening of the recto-vaginal wall, so that the urine could pass into this new reservoir, was successfully done by Dr. Goodell. He states, "I was emboldened to recommend this step because a very analogous operation had succeeded in the hands of my friend Dr. W. W. Keen." This operation, however, was really proposed by Da Costa Duarte in 1865, and the most essential point as to its feasibility had been demonstrated by Baker Brown in 1860. But in this matter we must go further back than either Da Costa Duarte or Baker Brown. In 1836,³ Jobert proposed an operation the same as that suggested by Duarte. In 1845, Berard, in response to members of the Academy who suggested that the presence of urine in the vagina would prevent cicatrization after the operation for closure of the vulva, said: "Admitting that the urine by its presence tends to open up the passage we wish to close, would it not be proper to form a new temporary route for it by puncturing through the rectum?" In 1851-52, Maisonneuve made a recto-vaginal fistula, and closed the vulva. Subsequently, he made a perineal fistula for the evacuation of the urine, but the patient had mortal phlebitis.

¹ Des Calculs de la Vessie chez la Femme et les Petites Filles. By Paul Hybord, Paris, 1872.

² In one of these fatal cases the vesico-vaginal opening was spontaneous, and the death was from pneumonia: this case, therefore, should be excluded, and the mortality would be one in ten. The cases of urethral lithotomy given by Hybord present a frightful mortality—twenty cases and eight deaths—one of these deaths, however, was from pulmonary consumption, and three months after, and excluding this, we have nineteen operations and seven deaths.

³ For these references I am indebted to a monograph, Du Klesis Génital. By Anatole Le Double, Paris, 1876.

The second case referred to in this lesson is one of enormous fatty tumour of the left labium—an illustration of it is given on p. 64—successfully removed by Dr. Goodell.

The sixth and seventh lessons, upon Prevention and Cure of Laceration of the Perineum, present no occasion for special remark. They are both excellent.

Local and Constitutional Treatment for Chronic Metritis and Endometritis is considered in the eighth lesson. In referring to intra-uterine applications, the author makes the following remarkable statement:—

"I have come to the conclusion that he is the most successful gynecologist who is the most plucky, and that, no matter how severe or how mild the treatment of uterine disorders, the percentage of accidents will be about the same."

At least the judiciousness of this statement might be questioned by some. We should like it to be understood that the pluck spoken of must be intelligent, and is utterly different from recklessness.

In the course of the lesson, Dr. Goodell thus tersely expresses his creed of uterine pathology and therapeutics:—

"Since congestion is the essential basis, the *punctum saliens* of uterine disorders, it stands to reason that local blood-letting should be the remedy."

Excellent directions follow as to when and how to use local depletion. There is one injunction, however, which seems to us useless, and that is the stereotyped one as to plugging with cotton the os uteri in the application of leeches to the cervix, for in the majority of cases requiring such application there is an abundant secretion from the cervical glands, if not from the uterine cavity, which renders applying the cotton plug no easy matter, and at any rate is almost sure to wash it away in a few minutes. For some years we have not made this generally futile effort, and though using leeches frequently, have never had a case where the leech entered the uterine cavity or even attached itself to the cervical canal.

Under the head of Constitutional Treatment some ten formulae are given, which will, doubtless by the time these lines are in print, have been many times faithfully copied, and might be found on the files of numerous drug-stores.

Five lessons, commencing with the ninth, are chiefly occupied with uterine displacements and their treatment.

Prolapse of the Womb, whether real or hypertrophic, and its treatment occupies the next two lessons. It is quite evident that Dr. Goodell does not indorse the following declaration of Dr. Emmet:¹ "In fact, I am satisfied from experience that removal of the cervix is never called for except in some forms of malignant disease." He, *i. e.*, Dr. Goodell, refers to cases of "hypertrophic elongation of the infra-vaginal portion of the cervix,"² in which he has performed amputation, and he also presents some excellent illustrations from Hegar of the method of operating.

The sixteenth lesson, Laceration of the Cervix Uteri, is one of the most valuable in the book. No writer has more graphically depicted this lesion, its consequences and diagnosis, or more clearly explained the method of operating.

¹ Principles and Practice of Gynæcology, p. 481. By the way does it not seem remarkable that New York and Philadelphia cannot agree in orthography. The one gives a work on Gynæcology, the other on Gynecology.

² Intra-vaginal seems to the reviewer a better term. And why not omit "portion of the"?

Cancer of the Womb is the subject of the seventeenth lesson. Dr. Goodell in referring to the greater frequency of cancer of the neck than of the body of the womb remarks: "The part first attacked is that which bears the brunt of the 'insults' of coition and of parturition." Insults is excellent! It recalls Molière's words in *Les Precieuses Ridicules*, . . . "a sedan chair is a wonderful protection against the insults of mud and bad weather." But no sedan chair can protect the uterus from the insults of coition and parturition! On p. 188, the author makes the following just remarks:—

"While unprepared to range myself under the banner of the 'localists,' I am yet sure that uterine cancer very commonly attacks women of fine physique and blooming health, and that, as pointed out by Cruveilhier, a cancer of this organ is, of all cancers, the least prone to affect the system. The victims die, not so much from specific systemic poisoning and from transference to distant organs, as from septicæmia, from embolism, and from the exhaustion induced by pain, by sleeplessness, and by the bloody or the serous fluxes. I am also further satisfied that the patient of the 'localist' will live longer, suffer less, and stand a better chance of a cure than the woman who is treated with palliative measures only."

Dr. Goodell gives some very interesting cases where operations greatly retarded the progress of the disease, and others where these were followed by complete recovery. Similar experiences are recorded by Dr. Sims in a valuable paper¹ recently published.

Probably what is now most needed in the clinical study of uterine cancer is a recognition of the malady, if possible, in its earlier if not in its earliest stages. The vast majority of cases of this terrible disease usually come under the observation of the physician when it has so far advanced that an operation, if performed at all, is done with the mere prospect of palliation, not with the hope of cure. Pain which in many minor ailments makes outcry enough, in this generally fails to warn the patient of any danger at a time when operative interference would be most likely to be followed by success. The menorrhagia or metrorrhagia which usually first attracts the patient's attention, and by its persistence or profuseness compels her to consult her medical adviser, is a late rather than an early symptom of the disease. But may there not be found by a closer, more scrutinizing study of cases, some earlier indication of uterine disorder that will point to the necessity of uterine examination, and the disease then be detected before pains and hemorrhage have given their alarm?

Vegetations of the Endometrium is the subject of the eighteenth lesson. It is one of the most valuable of the lessons, containing as it does very instructive cases and excellent rules of practice. In the treatment of that variety of these vegetations known as *endometritis hyperplastica*, the curette is all important. Dr. G. recommends the dull wire curette of Thomas, or that failing, the sharp curette of Sims. We have generally found the curette forceps of Emmet the only instrument necessary; and, if a curette proper is required, we prefer that of Recamier.

The nineteenth lesson is devoted to Polypus of the Womb. In considering the etiology of the disease, Dr. Goodell states: "Sterility and single life are pre-eminent factors in the production of these tumours," p. 219. We are not sure that this statement is correct. Dr. Lever's² assertion

¹ The Treatment of Epithelioma of the Cervix Uteri. American Journal of Obstetrics, July, 1879.

² Lee on Uterine Tumours, p. 34.

was "that the disease was more frequent in the unmarried than in the married, in the proportion of seven to three." But have his statistics been verified by others? Waller's¹ words are that polypus sometimes occurs "in unmarried females." Churchill² states that it is as frequent in virgins as in the married. Wieland and Dubrisay,³ who consider mucous polypi under the head of acute and chronic metritis, remark that unsatisfied venereal desire, celibacy, suppression of perspiration, or of a hemorrhage, profound emotion, etc., have been regarded as causes of internal metritis, adding that "these causes which are constantly invoked, not only for metritis but for many other maladies, appear to have but a trifling influence." So far as sterility is concerned, is that not a consequence of the polypus rather than its cause? Dr. Barnes⁴ remarks, "Generally, however, polypi prevent pregnancy." Schroeder⁵ says: "Sterility, due partly to catarrh of the uterine mucous membrane, partly to the mechanical obstruction, is the usual, if not the uniform result of polypus."

Dr. Goodell, in sustaining the assertion quoted, further remarks:—

"My experience is that you will find them to be more frequently the cause than any other factor; but why should they produce them? you will ask. Because the irritation of menstruation continues without any breach. Nature never intends that the monthly congestion should go on indefinitely, but she expects such interruptions as gestation and lactation usually bring. Another cause, closely relating to the preceding, is perverted sexual relations, which excite and irritate without satisfying. In short, uterine polypi and uterine vegetation start pretty much from the same causes."

Admitting the fact, the explanation seems quite rational; but it should be remembered that children sometimes have these growths, one having been observed in a child only two years old; what has celibacy or sterility to do with such cases?

In referring to the diagnosis between polypus and inversion of the uterus, the author remarks:—

"Again, to make sure of no error in this matter, withhold all anaesthetics, and tighten the loop of the écraseur very slowly. If now the woman complains of great pain, some portion of the womb has been noosed." But given a large fibroid polypus with a short, thick pedicle, the tightening of the noose around such a pedicle is surely followed by severe pain. It is reasonable that it should be so, and we know that it is, from observation of such a case.

The twentieth and twenty-first lessons are occupied with Uterine Fibroids and their Treatment.

Dr. Goodell states that from his own observations, those of Dr. Fordyce Barker, and the statistics of Mr. Pollock, he is "inclined to think that single and multiple tumours are about equally divided." On the other hand, Gallard⁶ has stated that it is extremely rare to find but one tumour.

We pass on to the twenty-second lesson entitled, "Spaying for Fibroid Tumour of the Womb, and for other Disorders of Menstrual Life." As to the term used, Dr. Goodell remarks, after alluding to the just criticism of the words *normal ovariotomy*, "Now, since it is important to distinguish

¹ Lectures on the Functions and Diseases of the Womb.

² Diseases of Women.

³ French Translation of Dr. Churchill's Diseases of Women.

⁴ Clinical History of the Medical and Surgical Diseases of Women.

⁵ Diseases of the Female Sexual Organs.

⁶ Leçons Cliniques sur les Maladies des Femmes, Paris, 1873.

this operation from that of ovariotomy proper, and since it is not easy to define, except by circumlocution, I shall call it *spaying*—a term which as technically defines the character of the operation as castration defines the analogous operation in the male."

The criticism generally made upon this selection is that the word is in common use for an operation upon certain inferior animals, and carries with it repulsive associations. The "Conjurer" in Hudibras,

"—— With the moon was more familiar
Than e'er was almanack well-willer."

And, from this familiarity, knew, among other things,

"When sows and bitches may be spay'd,
And in what sign best eider's made."

Heifers, too, are nowadays frequently the subjects of the spayer's art. Ought we not to have some better word, or even prefer a circumlocution, for the operation upon women? Spaying smells of the cow-stable, of the kennel, and the pig-pen. Furthermore, the purpose of spaying inferior animals (we refer now only to sows and heifers) is to make them fatten more readily and thus fit them for market: the term is, therefore, suggestive of the slaughter-house and of the shambles.

Finally, spay is not such a legitimate possessor of its present domain that it is entitled to any addition of territory; indeed, it has no hereditary right to that which it now holds. It has come to us from the Latin *spado*, which means¹ "a gelding, whether horse or man." Upon referring to Tacitus and Juvenal, it will be found that each of these authors makes it the equivalent of eunuch. In the first of Juvenal's satires these words occur:—

Cum tener uxorem ducat spado.²

Tener spado can mean nothing else but soft eunuch.

But, going a little further in this philological excursion, spado came from the Greek *σπάδων*, plural, *σπάδοντες*, which is defined³ as "an eunuch." Nevertheless, Aristotle draws a distinction between the eunuch and the spado. The following⁴ is a Latin translation of his reference to the subject—a Latin translation because easier to write and easier to read than the Greek. "Qua re differt spado ab eunuco? Quod eunuchum quidem adolescentuli atestate testibus privarunt, spadonem vero proiecta jam atestate." So then, the spado and the eunuch only differed in the time at which they were deprived of their testicles. A reference will be found in the *Scholia Graeca in Aristophanem* to *σπάδων* in which this distinction is not recognized. We might prolong this excursion, but enough has been adduced to show that to apply the term spaying to removal of the ovaries of any animal is purely arbitrary, and is an utter perversion of the word so far as its etymological history and early application are concerned.

We hope Dr. Goodell will abandon the use of the word in future editions, else spay and antispay may become the strophe and antistrophe of book and of criticism.

The distinguished gentleman who originated the operation, Dr. Robert

¹ Ainsworth's Dictionary.

² The reason for this *unique* selection is given in the sixth Satire: Some women ever take delight in unmanly eunuchs, and soft kisses, and the loss of all hope of beards that precludes the necessity of abortives. Yet the summit of their pleasure is when this operation has been performed in the heat and prime of manhood, and the only loss sustained is that the surgeon, Heliodorus, cheats the barber of his fees.

³ Liddell and Scott.

⁴ Problematum Ineditorum, Section xi.

Battey, in terming it normal ovariotomy, selected a name which satisfied neither himself nor the profession. If this be normal ovariotomy what is abnormal ovariotomy? If the word normal be, by a somewhat arbitrary extension of the term, and by use made synonymous with healthy or sound, and describe the condition of the ovaries, it states what was proved untrue in many of the cases in which the operation has been performed. And then can there be *normal* surgical operations, when such operations are a confession of the impotence of medical therapeutics? Better than spaying or normal ovariotomy a circumlocution; or else as the condition induced by the operation is *agenesia*,¹ we may call the operation *agenesic ovariotomy*. If objection be made to *agenesia* as not being the primary condition sought and induced by the operation, certainly *amenia* is, and the operation might be called *amenic ovariotomy*. Professor Simpson, in his successful case reported in the *British Medical Journal*, May, 1879, describes it under the title of *double oophorectomy*.

But turning from nominal discussion let us come to the reality.

Dr. Goodell refers to the causes for which Dr. Battey's operation has generally been performed, and its uncertainty in some cases as a therapeutic measure, adding:—

"But about fibroid tumours of the womb there can be no doubt. The relation here between cause and effect is unmistakable. Their growth and morbid effects are notably increased at each monthly flux, and notably lessened after the climacteric. In but few other pelvic disorders can we so positively single out the ovaries as the hurtful organ."

This is the foundation upon which he rests the argument for removal of the ovaries in cases of uterine fibroids attended with exhausting hemorrhages, when vaginal enucleation is impossible, contrasting the ovariotomy with hysterotomy or enucleation by gastrotomy. He even goes so far as to say after quoting West's statistics, twenty-eight cases of enucleation with fourteen deaths: "In view of these facts, I am by no means sure that when the question comes to lie between the removal of the ovaries, and the enucleation of a fibroid imprisoned by an undilated os uteri, the former will not be the operation of the future." The statistics of Pozzi² are more recent and present much more favourable results of enucleation, than do those of Dr. West. Pozzi gives but sixteen deaths in sixty-four cases. And it is remarkable that this is just the percentage of mortality in removal of the ovaries for uterine fibroids, twelve cases and three deaths. But, again as illustrating the differences of statistical results, showing how figures, though according to popular judgment they cannot lie, may contradict each other, Dr. Goodell says, "Yet it is a curious fact, established by Englisch,³ that of the cases in which extirpation of a healthy irreducible ovary was performed for hernia of that organ, one-half died of sub-peritoneal inflammation and its results."⁴ Now on the other hand, Puech's statistics, later and larger, reduce this mortality almost as low as one-third—six deaths in seventeen operations.

However, Dr. Goodell presents a strong argument in favour of what we venture to call *agenesic ovariotomy* in certain cases of uterine fibroids. He gives a table showing all the cases of removal of the ovaries, not merely

¹ Thomas's Pronouncing Dictionary, has nn in the word: there is no good reason for the second n. The New Sydenham Society's Lexicon gives the word as above.

² De la Valeur de l'Hystérotomie dans le Traitement des Tumeurs Fibreuses de l'Uterus, Paris, 1875.

³ Sydenham Year Book, 1871-2.

⁴ Annales de Gynécologie, June, 1879. Recherches sur les Hernies de l'Ovaire.

for fibroids, the method of operating, whether abdominal or vaginal, and the results. These statistics show the vaginal operation to be the safer one, thus contradicting the statement of Koeberlé,¹ that preference should by all means be given to the abdominal, and the same view as that of Koeberlé is also taken by Professor Simpson in the paper referred to a moment since.

Ovariotomy, abdominal and vaginal, is considered in the twenty-fourth and in the twenty-fifth lessons. The lessons are excellent, but we have no time for special remarks upon the topics presented in them.

The twenty-sixth lesson is entitled, Nerve-Tire and Womb-Ills, or the Relation of Neurasthenia to Diseases of the Womb. This long title suggests to the reviewer Pascal's thought in regard to Cleopatra's nose.² Now if the title had been shorter, the lesson would be quite changed. Nerve Tire and Womb-Ills has just the least flavour of sensationalism, though of course Dr. Goodell had no such thought. He has done wisely in omitting these objectionable words in the third volume of the Transactions of the American Gynaecological Society where this lesson appears as the Presidential Address delivered by him before the Society. The profession are already quite familiar through medical journals and through the Transactions with this excellent paper.

The twenty-seventh lesson gives Some Practical Hints for the Prevention of Uterine Disorders. This lesson contains a good many condensed aphorisms which will meet with the general approval of doctors; if they do not so much the worse for the doctors and their patients.

On p. 350 Dr. Goodell remarks:—

"Since labour is in general a strictly physiological process, there can be no sound reason why a woman should not sit up in bed or even slip into a chair whenever she feels so disposed. These are not idle phrases, but the conclusions of a long and well-sifted experience. Such movements excite the womb to contraction, and empty it and the vagina of putrid lochia which may be incarcerated by a clot or by the swollen condition of the soft parts."

This seems almost like an echo of the teaching of Dr. Samuel Bard, the first American author of a work on obstetrics.³ Seventy years ago this distinguished teacher said: "After one or two days women should rise from their beds and sit up for a longer or shorter time every day, according to their strength and inclination." "The lochia require no other attention than sitting up a short time every day to promote their evacuation."

We do not quite agree with Dr. Goodell in crediting the obstetric binder with being "a factor in the production of female complaints," nor are we content with such doubtful commendation, "the binder may be useful for the first four-and-twenty or forty-eight hours after labour."

How we wish every teacher and every mother would read and ponder the remarks pp. 353-4 *supra*, "too much brain-work, too little house-work!"

"The Relation which faulty Closet Accommodations bear to the Diseases of Women" is considered in the twenty-eighth lesson. The importance of this subject is not exaggerated, and the picture that Dr. Goodell

¹ Nouveau Dictionnaire de Médecine et de Chirurgie Pratiques, vol. xxv.

² Si le nez de Cléopâtre eût été plus court, toute la face de la terre aurait changée.

³ The first edition of Dr. Bard's Compendium of Midwifery was published in 1808, the fourth and last in 1817.

draws of such imperfect accommodations is wonderfully true. We have all seen, and alas too often, just such places as he describes.

The final lesson is upon "The Sexual Relations as Causes of Uterine Disorders." Love, courtship, long engagements, the common social amusements of the youth of each sex, and the honey-moon journey are briefly alluded to, while the most of the lesson is occupied with conjugal onanism.

In reference to two of the topics we make the following extracts:—

"Long engagements, by keeping up a wearing nervous erethism, are not only recognized but even classified by alienists as one of the causes of insanity in women. Much more frequently the nervous exaltation is spent on the reproductive organs, for this follows an awakening of sense, which is not, as in man, appeased by the distraction of business pursuits. Uterine disease from this source any open-eyed physician will over and over again see. If the caresses of lovers are prejudicial to good health, every like relation between the sexes must be exposed to like dangers. In too many rural districts, and in the lower classes of citizens, such license is tolerated in the social intercourse between the youth of each sex as must be destructive to good health and to good morals. Young people are left too much to themselves, and thrown too much together. These social gatherings are too rarely presided over by their mothers or their seniors. As a very natural consequence their games become coarse, their forfeits immodest, and little by little this freedom from restraint is liable finally to degenerate into such gross familiarities as would be improper between even affianced lovers. An unnatural sexual excitement is thus kept up, which must do physical harm."

We do not fully accept these conclusions of our author. For example, the injurious influence of long engagements upon female health is to be explained in the majority of cases, in our opinion, by psychical rather than physical causes. The long engagement exists from the youth of one or the other party, from the opposition of friends, from occasional estrangements, lovers' quarrels, from fickleness, hesitation, from an uncompleted professional education, or from the poverty of the man, etc. The uncertainty, the delay, the anxiety, the hope deferred making the heart sick, the seclusion from general society which occurs on the lady's part in many cases under such circumstances better explain, we fully believe, the ill-health that may result than primary affection of the sexual system, "any nervous exaltation spent upon the reproductive organs." From Tennyson we have learned—

"Woman is the lesser man, and all thy passions, matched with mine,
Are as moonlight unto sunlight, and as water unto wine."

The stream of her love for man rises higher, flows with a purer current than from any conscious sexual desire. She seeks not, but she is sought, when sexual intercourse occurs it is by submission, not by solicitation on her part; yea when she falls a victim to the betrayer it is because of the mighty passion of love, giving her very self to the one she trusts, and by no insane rapture of animal desire. It is recorded by Moreau¹ that this was the subject of a thesis sustained in the schools of Paris: *Est-ne fæmina viro sulacior?* The author of the thesis maintained the affirmative, and a part of his argument is given by Moreau. We have not so learned the womanly nature; we do not thus read woman's character. We firmly believe that one of the most imperious passions in man's breast, has small space in woman's heart, this passion with her in contrast with that of

¹ *Histoire Naturelle de la Femme*, Paris, 1803.

man is as moonlight unto sunlight, and as water unto wine. Moreover, our faith is that were young men so to regard woman, female virtue would less often be assailed, licentiousness diminished, and they would enter upon married life, mindful in spirit at least, of the injunction of Jeremy Taylor, "Marriage is a provision for supply of the natural necessities of the body, not for the artificial and procured appetites of the mind." These "procured appetites of the mind," how they lord it over feeble conscience and halting will, and make many a sad wife little better than a prostitute save in name! And those who thus sin are often men who have led continent lives. The learned Bayle in referring to Abelard and Heloise remarks, "A man who has lived chastely is more apt to fall into excess with his wife than a debauchee."

To return, Dr. Goodell in referring to the honeymoon, advises against sexual excess. But O, wise teacher, tell your pupils, tell the profession, where lie the boundaries of moderation, where excess begins. While no positive rules may be given, at least they may be approximated, and their inculcation will do a world of good.

In the discussion of "conjugal onanism," the author with a master's hand lays bare one of the deepest, foulest ulcers of the age. He shows how injurious such a course is to the health of women especially. "Should I marry?" said a shallow youth to the great Dr. Johnson. "Marry, sir? No sir! People marry to propagate, and you would propagate ignorance." Alas! people marry who propagate something more than ignorance, propagate foul and fatal diseases. Others marry not to propagate, and if a child comes it is an accident. How shall one or the other sin be corrected? Alas, for our groaning humanity, groaning in such depths of physical and moral evil! Thanks for the brave words Dr. Goodell has spoken so eloquently, words of rebuke, words of instruction and of warning. They will be helpful to the physician and to the philanthropist in hearty endeavours to correct one of the deep-seated evils of the day, a perpetual fountain of other evils.

But we must take leave of this admirable book, thanking its gifted author for what he has done, and expressing an earnest hope that the "Lessons" may soon grow into a complete treatise on diseases of women. T. P.

ART. XVI.—*La Trépanation Guidée par les Localisations Cérébrales.*

Par le Dr. JUST LUCAS-CHAMPIONNIÈRE, Chirurgien des Hôpitaux de Paris, Membre de la Société de Chirurgie. 8vo., pp. 150. Paris: Delahaye & Co., 1878.

Trehphining Guided by Cerebral Localization. By Dr. JUST LUCAS-CHAMPIONNIÈRE.

THE author of this work, M. Lucas-Championnière, is well and favourably known to readers of current French literature. His local rank and authority are indicated by his titles, and he has made himself by his practice and publications a quasi-official exponent of Mr. Lister's antiseptic theory in France. He has shown in many ways that he possesses the thorough professional education which so distinguishes the French, combined in a manner as rare as it is valuable with an ability to think accu-

rately for himself, unhampered by the chains of tradition that have weighed down so many of his colleagues. His report in 1875 of a case of monoplegia following the receipt of a blow upon the head, successfully treated by trephining, together with his hearty acceptance of the new ideas concerning motor centres in the brain, provoked much discussion in the societies and journals, and brought him prominently forward as a defender of the principle of the more frequent use of the trephine generally, and especially under circumstances when the only guide to its point of application is furnished by these physiological data. The theory has met with much opposition, notably in a report made by Prof. Gosselin to the Académie de Médecine, 3d April, 1877, upon two cases of trephining; and the pamphlet now before us is a formal presentation of the arguments in its favour and the answers to objections.

The argument is divided naturally into two parts; the first dealing with the advantages and the risks of the use of the trephine in general, and the second with the question of the sufficiency of limited paralysis as an indication of injury to a definite portion of the cortex of the brain, and of the value of trephining in the treatment of such an injury.

The use of the trephine in modern surgery is, as a rule, rare, and its results have been, apparently, so deplorable that the surgical records of this century and the teachings of modern surgeons are a formidable obstacle to an advocate of the use of this instrument. It is not surprising, then, that M. Lucas-Championnière formally rejects these records almost entirely, charging the fatality not upon the operation, but upon the accidents that necessitated it, and especially upon the delay in performing it, and draws the material for this part of his argument largely from sources that have hitherto been exploited only by the antthropologists. In no other instance, we believe, has the prehistoric man furnished any contribution to surgery, and it was hardly to be expected that his scanty, long-neglected remains would be called upon to show that in his estimate of some things he was more correct than his highly self-respecting, intellectually evolutionized descendant. But such seems, nevertheless, to be the case. The cave dweller of the neolithic age trephined his fellows frequently, and saw them recover. Of his reasons for doing it we are not so certain, for here we have to depend upon that use of the imagination which, although dignified with the epithet *scientific* by the philosopher who practises it, is hotly condemned by him as fanciful and sentimental when employed by his opponent.

The facts are as follows: A number of prehistoric skulls have been found, from which a disk of bone has been removed during the life of the individual by drilling a circle of holes around it with a sharp-pointed stone. In some cases the condition of the sutures and the character of the subsequent development of the skull indicate that the individual underwent the operation in childhood. Other skulls are found showing much larger, regular losses of substance produced after death. Fragments of bone, one side of which evidently formed part of the border of a hole left by trephining, are found suspended upon necklaces or lying within other skulls of which they originally formed no part. The explanation offered by such men as Prof. Broca, Prunières, De Baye, and De Mortillet, and supported by more modern facts to be mentioned in a moment, is that the operation had a religious character, either as a rite of initiation into the priesthood, or by conferring a reputation for sanctity upon the survivor, especially if, as is not unlikely, he was a child afflicted with epilepsy or convulsions.

These are diseases which have always inspired a sentiment of dread, and, as some of their names show—*divinus morbus, deifica lues, morbus sacer*—have been thought to have a peculiarly divine or sacred origin. Fragments of the skull of such an individual might be worn as amulets after his death or placed within the skulls of the recently dead as a viaticum. The author's speculation that the tonsure of the Roman priesthood is a survival of this practice is ingenious, but foreign to the present purpose.

Corroborative testimony is furnished by various savage tribes now existing in different parts of the world. South Sea Islanders trephine with a piece of glass for the relief of headache, neuralgia, and vertigo. Haytians and Mexicans do the same, and especially for fractures of the skull. Among the fierce Kabyles of Algeria trephining is practised for the slightest injuries, and sometimes even without any apparent reason: the operators are native physicians, invested with a sacred character by reason of their performance of the operation; the instruments even are considered sacred and cannot be bought, they are handed down from generation to generation with the exclusive right to their use. Many of the Kabyles, often the operators themselves, have undergone the operation several times; they consider its danger slight and submit themselves to it coolly and at all ages.

The argument thus begun, that trephining is not in itself a dangerous operation, is carried on by a citation of facts and opinions to show that while trephining was so rarely employed in England, France, and especially in Germany, during the first half of this century that it might be said to have been practically abandoned, yet many of the best surgeons publicly maintained its propriety on theoretical grounds. By its limitation to the most severe cases, and especially by the delay in practising it, its recorded mortality rose above that of non-intervention, and increased, if possible, its disrepute. In the United States it was in more general use, and during our Rebellion it was performed 229 times, with 101 recoveries, 126 deaths, and 2 unknown. A singular exception to this general rejection of the trephine is furnished by the practice among the miners in Cornwall, where fractures of the skull are frequent, and it is the rule to trephine immediately, the operation being always expected and even insisted upon by the patient or his friends. A Dr. Michel reports that during his apprenticeship in this district a week rarely passed without one of these operations, and sometimes as many as three were performed in a single day at the surgeon's office, the patients returning afterwards to their homes. One surgeon had sixty-four disks removed by himself, and another reported that while a student in his father's office he had seen him operate forty or fifty times. Mr. Robert Hudson, who published these facts in the *British Medical Journal*, July, 1877, says the patients as a rule recovered, and he attributes the success to the purity of the air and the early performance of the operation, comparing it in this respect to kelotomy.

The final argument is of course drawn from the success of antiseptic surgery, and it is claimed that the immunity conferred by Mr. Lister's method upon the gravest operations will be extended also to the removal of a portion of the cranium or the simple exposure of the dura mater. A few successful cases are mentioned in support of the claim, among them one in which Mr. Lister opened the longitudinal sinus, and arrested the "terrible bleeding" from it by plugging the opening with a bunch of catgut ligatures.

The second branch of the subject, dealing with the surgical uses to be

made of the theory of motor centres in the brain, possesses a more novel interest. Briefly stated, the theory is that in the cortex of the brain, within a region lying under the anterior half of either parietal bone, are to be found distinct areas from which proceed the impulses that excite movements in different groups of muscles on the opposite side of the body. When any one of these areas is irritated the corresponding muscles are convulsed; when it is crushed or compressed the muscles are paralyzed. The surgical inference is the converse of the last statement; paralysis limited to one or more groups of muscles indicates a lesion of a corresponding limited area of the surface of the brain; and the therapeutical rule sought to be established is that under such circumstances the trephine should be applied over this area for the removal of the cause, whether it be a collection of pus, a clot of blood, or a depressed fragment of bone.

Our knowledge of special centres in the brain is a recent acquisition. The first contribution to the subject was made by Broca about ten years ago in locating the centre for articulate speech at the posterior extremity of the third frontal convolution on the left side. Since then, Ferrier in England, Fritsch and Hitzig in Germany, and Charcot and Pitres in France, by experiments upon animals and observations upon men, have established, with only slight disagreements, centres for the action of all the larger groups of muscle. Some physiologists, prominent among whom is Brown-Séquard, have denied the accuracy of these assertions, and claimed that all movements produced experimentally by electrization of the surface of the brain are due to the action of the currents upon its base. We cannot undertake to examine all the arguments urged in support of, and in opposition to, the theory, but the answer to this objection, which is a serious one because it attacks the accuracy of the experiments upon which the theory is founded, must be stated. It is this: electrization of given points on the surface always excites movements in the same muscles; if this action were due to diffusion of the currents to the base of the brain it would not always be the same, for the very idea of diffusion precludes limitation of the effect, and the electrization which causes movements in the arm to-day would cause movements in the leg or the face to-morrow. The hypothesis of an unknown motor centre at the base is more difficult to accept in explanation of these experiments than that of localized centres on the surface, for which it is offered as a substitute. Moreover, the clinical facts are not affected by this objection.

The centre for articulate speech is situated, as we have said, at the posterior extremity of the third frontal convolution, just above the anterior extremity of the fissure of Sylvius. The motor centres lie on either side of the fissure of Rolando, which runs from the centre of speech backward and upward towards a point on the median line about two inches behind the site of the anterior fontanelle. The centres for sight and hearing lie behind and below the others, about the posterior end of the fissure of Sylvius. The centres are distributed in the following order, beginning at the upper end of the fissure of Rolando: 1st, the centre for the lower limb; 2d, centre for the arm (middle third of the adjoining convolutions); 3d, centre for the face (lower third). The differentiation has been carried much further, and special centres found for smaller groups and even for individual muscles, but the above is all that is required from the surgical standpoint.

The next thing is to establish a rule for tracing upon the scalp a line that will correspond with sufficient accuracy to the fissure of Rolando

about which all these centres lie. It is not necessary that this line, the "Rolandic line" as it is called, should represent the position of the fissure with mathematical exactness, for the diameter of the crown of the trephine is sufficient to correct any inconsiderable departure from the exact point sought. It is much more desirable to have a method that can be used promptly and readily with sufficient accuracy. The relations of the upper end of the fissure to the bregma, or point of intersection of the sagittal and coronal sutures, are very constant. The two points are distant from each other about two inches along the median line. It is, therefore, only necessary to find the bregma and measure $2\frac{1}{2}$ inches (55 millimetres) backward from it to determine one of the two points between which the line is to be drawn. The bregma is situated at the intersection of the sagittal suture and a vertical plane passing through the external auditory meatus on each side when the head is erect, and may, therefore, be found by drawing a tape line across the crown in this plane from one ear to the other. This method is liable to a slight error, on account of the difficulty of determining the position of the vertical plane, especially when the patient is recumbent, but with care the error is unlikely to amount to more than a quarter of an inch.

When time allows, M. Lucas-Championnière recommends a simple instrument employed by the craniologists to determine the position of the bregma. It consists of two narrow strips of steel united at a right angle. It is asserted that if the point at which the strips are joined is placed at the auditory meatus, the horizontal strip carried across the upper lip close against the nose, and the vertical one bent over the vertex, the latter will lie upon the bregma. In a number of experiments made to determine the accuracy of this method, we have found that while it indicates the position of the bregma correctly in some cases, it more frequently passes in front of it, sometimes even more than an inch. The assumption upon which the method is based, that the auriculo-bregmatic and auriculo-nasal planes are always at right angles to each other, is incorrect. We should, therefore, reject this method and trust to the first, the error of which cannot be great. Moreover, as it is situated at one end of the line it is diminished at all other points by the convergence of the true and false lines in their course downwards and upwards.

The point at which the line ends below and in front is found by taking a point on the posterior edge of the external angular process of the frontal bone, a little below the level of the upper margin of the orbit, and drawing a line directly backwards from it (the head supposed to be erect) for the distance of $2\frac{1}{2}$ inches (7 centimetres), and then a second line from the posterior end of the first $1\frac{1}{2}$ inches (3 centimetres) directly upwards. The upper end of the second line marks the point sought.

The motor area is in the form of a parallelogram an inch wide, traversed centrally by the Rolandic line, and stopping half an inch short of the sagittal suture. The centre for articulate speech lies at its lower anterior angle, or a little below and in front of it. Three applications of a trephine of ordinary size within this region will expose it to thorough examination, and it is not probable with a distinct, well limited paralysis, that more than one application would be required to disclose the lesion.

Paralysis of, or convulsions limited to, one lower extremity would require the trephine to be applied at the upper end of the motor region on the opposite side of the head; paralysis of the arm, at the middle third; paralysis of the face, at the lower third or at a point a little in front of it.

In simple aphasia a point should be chosen below and in front of the lower end of the line. In combinations of these paralyses the trephine should of course be placed at points intermediate to the respective centres.

In his collection of clinical facts to support these doctrines M. Lucas-Championnière has limited himself to the presentation of a few typical cases, including his own, and to an examination of 173 cases of paralysis following gunshot wounds of the skull recorded in the *Surgical History of the War of the Rebellion*, in 139 of which the parietal bone was the one involved. A typical case, to be useful for this purpose, must be one in which the traumatism is limited to the cranium and followed immediately by paralysis, and it is desirable also that the paralysis should be a monoplegia, for an extensive lesion, penetrating wound, etc., is less demonstrative. Convulsions, too, being phenomena of irritation, may be due to injury received at a certain distance from the irritated nerve centre; and secondary or tardy paralysis, being the result of later inflammatory processes, is open to the same objection.

It seldom happens in recorded cases that the seat of the lesion is described with sufficient detail to determine the exact position of an individual centre, but they furnish abundant testimony to the existence of a motor area for the opposite side of the body under the anterior half of each parietal bone. The author's own case is so complete an example of the correspondence between a localized injury and a localized group of symptoms, and of the principles of surgical interference guided by the new theory, that a brief account of it will be useful as an illustration.

The patient, a man 26 years old, was found insensible in the street and brought to the hospital on the night of the 15th Nov., 1874. On examination the next morning he was found in a condition of stupor, from which he could be but slightly roused; sensibility was preserved everywhere, but there was partial paralysis of motion in the right arm. The only lesion to be found was a slight superficial cut half an inch long over the left parietal eminence. Respiration slow and regular, pulse "calm." He remained in this condition until the 19th, when he was seen for the first time by M. Lucas-Championnière, who then took charge of the service. He was entirely unable to swallow, and was nourished by enemata. The left side of the head was shaved and another careful examination made. The wound had united and was perfectly dry, with no swelling about it, and apparently no tenderness on pressure. No fracture could be detected. There was ecchymosis in the eyelids and under the ocular conjunctiva; no escape of blood or serum from the ear. On the evening of the 20th the patient made a few convulsive movements, and on the morning of the 21st his stupor had increased, and convulsions occurred frequently with considerable violence, involving all parts of the body except the right forearm and hand. During the following night the convulsions became almost continuous, and the next morning his condition was decidedly worse; pulse 70 to 80 and very small, respiration laboured, temperature $96\frac{1}{2}^{\circ}$, head thrown back and agitated from side to side, convulsions very frequent, lips cyanosed and covered with froth.

Suspecting a fracture of the inner table, M. Lucas-Championnière decided to trephine immediately at the seat of the wound. After the bone had been exposed and the periosteum raised a fine fissure was seen at the anterior angle of the incision running forward. The incision was extended a considerable distance in the same direction, and disclosed a fracture situated above and in front of the ear. There was but slight depression,

and the fragments were tightly wedged together. The trephine was applied, and the fragments removed with some difficulty, one splinter extending under the edge of the opening. The dura mater was bruised but not torn, and pulsation could be seen through it. The wound was thoroughly washed with carbolized water, and covered with antiseptic dressings.

Five hours after the operation the patient was still somnolent, but had had no convulsive attacks, and had swallowed some liquids. His temperature had risen to $97\frac{1}{2}^{\circ}$. The next day he was less somnolent, opened his eyes when spoken to, and swallowed easily, but had a slight convulsion in the afternoon. On the 25th the stupor had disappeared, and it was found that the patient was unable to speak. On the 26th he recovered the use of his right arm, and on the 27th he sat up in bed. From this time on he improved steadily, but remained unable to speak until the 6th December, when he uttered the words *oui* and *non* distinctly. By the end of the month he was able to help in the wards, to read again, and to write.

Some points of the case require a word of comment. The paralysis was immediate, and the direct consequence of the depression of the bone. The convulsions began on the fifth day, and were due to the spread of an inflammatory process set up by the traumatism. The removal of the fragments arrested this process immediately, but more time was required to restore the integrity of the centres of speech and of the muscles of the right arm which had suffered the consequences not only of the direct injury but also of the local irritation maintained for more than seven days by the presence of the fragments. It seems probable that, if the fragments had been removed immediately after the receipt of the injury, the recovery would have been more rapid.

The fracture, as was proved by many subsequent measurements, was situated at the middle and lower portions of the Rolandic line, at a considerable distance in front of the small scalp wound. The surgeon, not being in possession of the more recently-discovered facts concerning cerebral localization, proceeded to trephine at the seat of the only apparent lesion, and was led to the right spot by the fortunate discovery of a fissure. Had he been aware of a motor centre for the arm (the stupor of the patient prevented recognition of the aphasia) it is possible that a careful examination of the corresponding point on the surface might have enabled him to detect the fracture through the scalp; and even if a surgeon should hesitate to trephine with nothing but a limited paralysis to guide him, he might well feel justified in making an exploratory incision at the indicated point in search of a fissure or other evidence that would be more convincing.

The theory has certainly done something for the art of surgery; it has at least indicated the points at which search must be made for a hidden lesion. Suppose a case somewhat like the above: a man is picked up in the street insensible, with paralysis of one extremity. Instead of having to explore the whole cranium the surgeon directs his attention at once to the anterior half of the parietal bone on the opposite side, and examines it in a manner and with a minuteness he could not well employ if the area to be examined were much larger. Or suppose that in a case of scalp wound with suspected fracture of the inner table, the trephine has been applied at the wound and nothing has been found; the doctrine of motor centres will then indicate the direction in which the opening should be enlarged.

The author has considered it necessary to go beyond the limited ques-

tion of trephining guided by the facts of cerebral localizations, and point out the indications for the use of the trephine under a variety of circumstances, some of which we may briefly mention, premising that his arguments are based upon the supposition that the antiseptic method will always be employed.

In a case of depressed fracture with absence of cerebral symptoms he would trephine immediately, or at the appearance of the first symptom ; he certainly would not wait until the symptoms became serious.

In compound fracture without depression he would not interfere unless, or until, there should be coma, paralysis, convulsions, or fever with or without delirium.

Coma is not in itself an indication, for it may be merely a symptom of concussion ; but it is an indication when associated with other symptoms, and especially with depression. It certainly is not a contraindication.

Paralysis is the best indication. It may be immediate or secondary, and its value is greater in the former than in the latter case, for primary, immediate paralysis indicates an existing permanent lesion of the brain, while secondary paralysis may be due to an inflammatory condition of the meninges or brain, possibly capable of spontaneous recovery. Moreover, it indicates the seat of the lesion less precisely, for a larger area is always involved. In primary paralysis the lesion of the brain is situated at the fracture ; in secondary paralysis it may be at some distance from it. The rule, therefore, would be in a case of primary paralysis to trephine immediately at the seat of the fracture with the object of removing depressed bone or a blood-clot ; and in secondary paralysis to trephine after the paralysis has lasted a day or two, or immediately if it is associated with general or partial convulsions, with the view of evacuating a collection of pus. If the application at the seat of the fracture does not yield the expected results, trephine a second time over the motor centre corresponding to the paralyzed muscles.

Convulsions, in themselves, are an indication only when they are localized and persistent, and especially if they alternate with paralysis of the same muscles.

In a case of suspected fracture of the inner table he considers the trephine rigorously indicated on the occurrence of the first serious symptom, especially a paralysis ; and its point of application should be selected according to the theory of motor centres. The indication is the same whether the symptoms are primary or secondary, but in the latter case the operator should be prepared to make a larger opening and to incise the dura mater.

L. A. S.

ANALYTICAL AND BIBLIOGRAPHICAL NOTICES.

ART. XVII.—*Guy's Hospital Reports.* Edited by H. G. HOWSE, M.S., and FREDERICK TAYLOR, M.D. Third Series. Vol. XXIV. 8vo. pp. xx., 498. London: J. & A. Churchill, 1879.

ALWAYS a welcome visitor, the Report of Guy's Hospital for 1879 is not unworthy of its predecessors. It contains twenty papers, of which we will first notice those of surgical interest.

MR. THOMAS BRYANT opens the volume with a paper of no little importance, *On the Value of Operative Interference in the Treatment of Inflammation of Bone*, being Part IV. of his *Reports on Operative Surgery* in former volumes. He gives twelve cases pertaining strictly to the subject, and illustrating the value of free and early incisions in periostitis and endostitis, resulting generally in speedy relief without necrosis; and also the value of drilling and trephining bone, the subject of chronic inflammation or of suppuration. That we often forget the analogy between the hard and the soft tissues in the various inflammatory processes is only too true, and he who would make an early incision in the soft parts, often waits in similar conditions in the hard, until the bone is hopelessly necrosed or the neighbouring joint involved. Drilling the bone is so easy and simple an operation, that we trust Mr. Bryant's name may tend to popularize it. Should it not relieve, the somewhat more serious operation of trephining may be resorted to.

The third paper also deals with bone, being *Three Cases of Injuries to the Elbow*, by MR. S. A. WRIGHT. The second case would furnish another argument to Dr. Allis in his war on the time-honoured anterior angular splint, for its application in an epiphyseal fracture produced occlusion of the arteries of the forearm for twenty-two days. The boy, we are told, "fell from some banisters." We presume Mr. Wright means fell from a "balustrade."

In narrating the third case (an unusual one of fracture of the head of the radius), the writer proposes two lines for guidance in diagnosing injuries at the elbow, and, although they are not entirely satisfactory, yet in the obscurity which so often surrounds joint injuries, especially in the elbow, we welcome every additional means of diagnosis as of some value. One of these is the old line between the condyles, best taken with the arm in horizontal extension, when the line will be vertical. The other extends from the internal condyle to the head of the radius. This will pass through the upper border of the olecranon and be bisected by its superior and external angle. It is of equal value in all positions of the joint. If the relation of any one of these points to the line is abnormal, displacement is shown, and its cause is to be sought in dislocation or fracture.

The second paper is by MR. CHARLES HIGGINS, on *Glaucoma*. There is little, if anything, new in the article, not even in his confession of ignorance as to the cause of the increased tension, or the reason of its relief by iridectomy. Brilliant empiricism has outstripped philosophic speculation and physiological experiment, as is not seldom the case in the healing art. Twenty-two cases are reported.

DR. W. A. BRAILEY contributes also an ophthalmological paper *On the Anatomy of the So-called Pars Ciliaris Retinæ and Suspensory Apparatus of the Lens of the Human Eye.* It has a plate containing six figures illustrating histological

details, and we must refer the reader interested in the subject to the original paper.

Article IX. is a *Note on a Case of Tetanus*, by Messrs. CARRINGTON and WRIGHT. In the gray matter of the spinal cord, on the right side, in the cervical enlargement, and in the lumbar enlargement on the left, visible cavities were found, two inches in length and about one-sixteenth inch in diameter, in the cervical region, the other much smaller. They were the results of softening, as shown by their margin of débris, which shaded off through a hyperæmic zone into healthy tissue.

Mr. C. H. GOLDRING-BIRD has a paper of thirty pages on *Constructive Inflammation and Ulcers*. He enters very minutely into the structure of embryonic tissue, granulation tissue, and cicatricial tissue, showing their relations to each other as well as the individual characters of each; and then into the process of "epithelialization" or "skinning." Ulcers are defined as "a limited area of granulation tissue upon the surface of the body," and their repair he believes to be not a pathological but a physiological process—the normal growth and epithelialization of granulation tissue wherever found. On this idea he shows what are the various kinds of ulcers. The paper is scarcely suited, either by its character or its length, for a place in a volume of hospital reports.

Two allied papers must next be noticed, one by Mr. W. E. PALEY and Dr. J. F. GOODHART, entitled *A Contribution to the Etiology of Scarlatina in Surgical Cases*, as observed in the Evelina Hospital for Sick Children, and the other by Mr. H. G. HOWSE, on *An Epidemic of Surgical Scarlatina*, in Astley Cooper Ward of Guy's, in 1878. The first paper contains details of twenty-five cases of surgical scarlatina (besides some of measles, etc.), all that occurred from 1869 to 1878, while the second, details four cases occurring within a month, the last three, indeed, within eight days. Both Dr. Goodhart and Mr. Howse were originally of opinion that such a roseoloid rash was not scarlatina, but merely one of the first indications of septicæmia. But after observing the probable infection, the sources of which are often most carefully traced, the symptoms, such as the rash, the fever, the sore throat, the desquamation, and the albuminuria, and the infection of others with distinct non-surgical scarlet fever as a sequel, they have been convinced that it is true scarlatina—a conclusion any fair reader can scarcely controvert, especially if he have seen any cases of it himself. The important conclusion, especially applicable to hospitals for children, is well formulated by Mr. Howse: *That any case which develops a high temperature with roseoloid rash, either within a short period after an operation or during the course of some surgical malady involving suppuration or discharges of any kind, ought to be treated by isolation just as if it was a proved case of scarlatina, and not permitted to return to the ward until the period of desquamation is quite passed.* Such a course at once arrested the epidemic giving title to the paper.

Both of the papers definitely support Paget's previously expressed explanations, that either the condition induced by an operation gives a peculiar liability to the reception of the poison, or else, that having received it already, had the patient not been in ill health, he might have resisted it longer or entirely. But they clearly widen the explanation, and make it apply to any local inflammation, especially if attended with suppuration, for one-third of Dr. Goodhart's cases had had no operation at all. Another important fact is, that of the twenty-nine cases seventeen were dressed antiseptically. Mr. Goodhart draws the conclusion that the contagion obtained its hold on them, not through the wound, but in the ordinary way, for if the antiseptic dressing has banished (as it has) from their wards septicæmia, pyæmia, and erysipelas, the poison of scarlatina would probably also

have been prevented access by the wound. Mr. Howse would add to this that had antiseptics not been used, the high temperature induced by the fever would have favoured decomposition in the wound, and so the whole train of septicaemic symptoms would have followed the rash which is so often its initial step ; but that this decomposition was prevented by the antiseptic system. Both of them, we believe, are legitimate conclusions.

The next paper to be noticed is the one by Mr. R. C. LUCAS, entitled *Clinical Surgical Studies*. He narrates two cases, both of interest. The first is a successful amputation of the thigh, which illustrates very well the importance of attention to small details, and the happy results which may follow. The patient, æt. 20, had a large osteoid chondroma of the left femur, the result of a fracture. The well leg was wrapped in cotton and flannel, and the body well blanketed to prevent cold. Esmarch's bandage was applied up to the knee, and Lister's tourniquet then applied to the aorta, although it seems not to have arrested the pulsation. An antero-internal flap was dissected, and the vessels secured by two torsion forceps, divided between them, and each end twisted. Lister's method was used, except the spray. Of its value in preventing danger from erysipelas, he is so fully convinced, that he has "twice amputated the leg in the erysipelas ward, and kept the patients side by side with patients suffering from erysipelas until their complete recovery." His recovery was remarkable. Only on four days did the temperature rise above 100°, the highest being 101.2°. He had almost no suppuration, sat up in three weeks, and left the hospital in six with the stump entirely healed. Six months later he was readmitted for a generalized return of the disease in a sarcomatous form, and died six weeks later.

The second case was that of a femoral hernia in a woman suffering from orthopnoea and general dropsy, the result of cardiac disease. Twice at an interval of ten months the hernia became strangulated and was operated on, ether being used the first time and chloroform the second, in spite of the cardiac disease. She died eleven days after the second operation, when an unsuspected hemorrhage of large amount was found in the iliac fossa probably from a vein which was greatly engorged from the cardiac trouble. The dropsy, the œdema, and the compulsory erect posture were serious mechanical obstacles in the operations.

Mr. N. DAVIES-COLLEY furnishes two papers. The first records a *Case of Removal of the Uterus and Ovaries for a Fibroid Tumour of the Uterus*, weighing 25 pounds. The value of the antiseptic method is again shown in the fact that only once did the temperature rise to 101°, and no symptom of peritonitis followed. The clamp was removed after sixteen days.

The second is on *The Bloodless Removal of Vascular Tumours*, a subject almost as fertile as that now threadbare topic the "treatment of the pedicle." If we may trust the doctrine of evolution we shall however in time arrive at perfection in both. Mr. Colley's method is modified from Teale's, and has merits not to be overlooked. "Two strong needles threaded with wire sutures transfix the base of the tumour, the needles lying parallel to each other and perpendicular to the long axis of the naevus with their points of entrance and exit at least a quarter of an inch from its margin. A hare-lip pin is next introduced in the same way but at right angles to the needles. India-rubber tubing is next wound beneath the exposed extremities of the needles and pin, and the growth dissected out, leaving the skin over it if it seems but little affected." The needles are then drawn through, the wire sutures are twisted, and the pin and the tubing are withdrawn. No bleeding follows.

W. W. K.

Though fewer in number than the papers of purely surgical interest, the medical papers form the bulk of the volume before us and comprise articles by such well-

known writers as Drs. Wilks, Habershon, Goodhart, Savage, Mahomed, Hilton Fagge, and Frederick Taylor.

The first of these is a long historical paper by Dr. SAMUEL WILKS, on the *Physiology of the Nervous System*, with especial reference to the influence exerted by the older phrenological writers on the development of our knowledge of nerve physiology, particularly such subjects as the relation of brain and mind, the use of the double brain, aphasia, the sense of weight and muscular resistance. The paper will be read with great pleasure by all who are interested in such subjects, but is not an article to which we can at all do justice in an abstract.

The next paper is by Dr. S. O. HABERSHON, and is entitled *Clinical Cases of Disease of the Brain*, divided into three headings of Abscess, Embolism, and Tumour. Under the first heading the author gives a tabular statement of 31 cases of abscess in the brain that had occurred in Guy's Hospital since 1857, when Sir William Gull published the previous cases, with a detailed account of five cases occurring under his care, and one of earies of the cervical vertebrae simulating cerebral abscess. These cases are all interesting and thoroughly reported, but add little light to the obscurity surrounding this subject. The first case under the heading of embolism is mainly of interest as illustrating the fact that aneurismal disease of the brain may occur in young subjects, and is not necessarily connected with advanced life and chronic degeneration of the vessels. A young girl, at. 16, after two attacks of rheumatism in early childhood, had a convulsion five months before admission to the hospital, which left her with left hemiplegia and partial loss of sensation, from which she partially recovered. Soon after admission, the partial paralysis remaining though there was no loss of sensation, she had an attack of pharyngitis which extended downwards, causing thickening and ulceration of the arytaeno-epiglottidean folds and necessitating tracheotomy. She died the next day. She had albuminous urine and a systolic cardiac murmur. At the autopsy an aneurism, half an inch by three-quarters, was found about an inch from the origin of the middle cerebral artery. No emboli were found, though the middle cerebral artery leading to the aneurism contained a little unadherent clot. The temporo-sphenoidal lobes, corpus striatum, outer part of lenticular nucleus, claustrum and external capsule were extensively softened. In addition to the disease of the throat and larynx, the lungs were pneumonic, and the heart showed signs of old endo- and pericarditis; the post-mortem also showed that there had been inflammation of the cellular tissue of the mediastinum, and that a small layer of pus surrounded the recurrent laryngeal nerve, which by producing spasm of the vocal cords serves to explain, in the absence of any oedema glottidis, the intense dyspnœa.

Dr. Habershon has also reported, among other cases under the division of tumours, an interesting case of bulbar paralysis, especially affecting the larynx, in which a glioma was found in the pons and medulla oblongata.

Two cases of *Cancer of the Stomach*, in one case implicating the left lobe of the liver, and in the other causing death by perforation of the cœliac axis, supply Dr. HABERSHON with a text on which he has contributed a concise and graphic account of the symptoms and progress of gastric cancer, with a few suggestions as to the treatment he has found most efficacious. One case seems to illustrate the fact that simple ulcer of the stomach may prove the starting-point of malignant disease, in cases where there is such a tendency, in the same way that a blow on the breast may prove the precursor of cancer, not as its cause, but rather the reason for the mischief selecting that particular part.

The next paper is by Dr. JAMES F. GOODHART, and is entitled *Acute Dilatation of the Heart as a Cause of Death in Scarlatinal Dropsy*. In it the author maintains that, in addition to oedema of the lungs, uræmic convulsions, and inflammation of the serous membranes of the thorax, as the causes to which death in scarlatinal

nephritis is usually attributed, acute dilatation of the heart is of frequent occurrence, and will explain many cases of sudden or comparatively sudden death which are not satisfactorily accounted for by the modes of death thought most usual in that disease ; and he reports five cases in which death occurred after severe respiratory distress, in four of which post-mortem examination showed extensive dilatation of the left ventricle with thinning of its walls. As regards the causes concerned in the production of this result, he argues that, since there was no valvular disease in any case, the dilatation must have been due to failure of the muscular tissue either in doing its ordinary work or under some special strain, or, as is probably the case, to the existence of both degeneration of tissue, and excessive demand on the cardiac muscle. The latter condition he finds in the increased strain thrown upon the heart by the suddenly augmented arterial tension of acute nephritis, for even in chronic Bright's disease, when the heart has become in some measure accustomed to the strain, and hypertrophy taken place, by which the muscular power has been increased, dilatation will still occur ; especially, then, would it be expected that dilatation would occur when the strain comes suddenly on a heart not protected by hypertrophy.

As an instance of the degenerative changes occurring in the cardiac muscle, Dr. Goodhart relates the case of a girl, æt. 13, in which the heart tissue was found in a state of fatty degeneration after scirratinous nephritis ; for this he finds sufficient cause either in the pyrexia, which is known to produce granular degeneration of muscular tissue, or more probably in the anaemia consequent upon the nephritis.

As regards treatment, the indications that the author follows are to endeavour "to counteract or prevent the anaemia which is so constant in renal disease ; to prevent, if possible, the arterial tension reaching so high a point as to endanger the functional integrity of the heart; or to relieve the tension if it should occur." For the first he recommends the milder forms of iron, and for both the first and second indications the *timely* administration of the usual eliminants and particularly the hydragogue cathartics. For the third condition he recommends, in addition to the purgatives, the infusion of digitalis.

Dr. FREDERICK TAYLOR has contributed an account of an extremely interesting *Case of Disease of the Brain, with Descending Degeneration of the Spinal Cord.* A boy, æt. 6, after falling on the back of his head gradually lost power over his legs, his gait being unsteady and tottering, frequently seeming to overbalance himself and then quickly save himself from falling with the other leg. There was no absolute paralysis ; towards the last three months of his life, eight months after the injury, any voluntary movement of his limbs quickly induced a tonic involuntary spasm. His intelligence was impaired and his eyesight imperfect (central vision only), though the optic disk and fundus were normal ; there was no loss of sensation or hearing. On post-mortem examination there were found no evidences of meningitis, though the veins were very full and the cortex very dark ; the base appeared normal in all respects. On separating the hemispheres, the posterior half of the corpus callosum was seen to be uniformly dark brown, translucent, and gelatinous. This condition, which the author regards as a form of primary degeneration, extended from the corpus callosum into the white matter of the posterior lobe on each side. Its general distribution may be described as follows : On the left side, besides involving all the white matter of the posterior half of the hemisphere, it ran down in an irregular manner, tongue-like, into the temporo-sphenoidal lobe, destroying only the central portions, and not approaching the gray matter ; in the deeper horizontal sections it was seen to involve just the posterior extremity of the lenticular nucleus ; the nucleus caudatus was in its greatest extent free. The whole left third frontal convolution was healthy. The

corpora quadrigemina were healthy. On the right side the disease did not advance so far forwards into the hemisphere as on the left side, but no examination was made of the middle or temporo-sphenoidal lobe. The lenticular nucleus was untouched, but the posterior portion of the thalamus (pulvinar) was involved. The hippocampi major and minor were normal on this side. The optic nerves, commissure, and anterior portion of the optic tracts were normal, but posteriorly they led into a mass of gelatinous material which included the corpora geniculata and posterior portions of the optic thalami. Portions of the lower surface of the crura cerebri were dark in colour, though it was not determined whether this was a primary or secondary change; the disease was the same on both sides, most intense on the inner side, and in the form of sharply defined quadrangular patches. The locus niger and substantia ferruginea of the tegmentum were unaffected. In the medulla, pons, and cord the disease occupied the usual seats of secondary degeneration; in the pons, affecting the vertical fibres of the anterior portion, especially those far out, less so those near the raphé. In the medulla, the anterior pyramids were affected, and throughout the spinal cord the posterior portions of the lateral columns adjacent to the posterior cornua were involved. In the cerebellum, the right corpus dentatum was dark and indistinct; on the left it was distinct, but the gray convoluted line excessively dark like the rest of the cerebral gray matter. In the middle peduncle of the cerebellum on the right side, a small dark gray patch was observed, but was not traced out. One of the most remarkable features of the case, however, is the character of the descending degeneration which was found in the spinal cord. It occupied the usual seat of descending degenerations secondary to cerebral hemorrhage or softening, "but it presents the peculiarity of being a double instead of a unilateral lesion. On each side it affects the crus cerebri, the vertical bundles in the anterior half of the pons, and the whole extent of the pyramids of the medulla oblongata. Below this point the diseased parts coalesce, and the lesion becomes single and median in position; it is obvious that we have here the point of decussation affected, and that where in the spinal cord below we find the diseased tracts again separated from one another, corresponding with the posterior part of each lateral column, it is because the two tracts, down which the disease is simultaneously coursing, have met and crossed at the point of decussation of the pyramids in the medulla oblongata." This portion of the contribution is particularly interesting as furnishing pathological confirmation of the observation of Flechsig as to the course of the pyramidal strands.

The next medical article is a long paper by GEORGE H. SAVAGE, M.D., entitled *Some Uncured Cases of Insanity*. He gives the following formidable list of symptoms which have appeared to him specially as of unfavourable omen: "Fatness; voracious and morbid appetite, eating feces; biting and gnawing the nails and fingers; picking of the face; malformations of the head; great sleepiness, and profound sleep that seems unrefreshing; marked changes in the skin, e.g., congestion and thinning; coarse hair; haematoma auris, especially if double. Other symptoms are, in some cases, objective enough, but are more related to the subjective mental condition: complete solitariness and self-absorption; complete change in habits and temper; love of gaudy, tasteless dress and decorations; collection of valueless articles and of rubbish; wearing of string and cotton rings on fingers; constant writing of letters, etc.; unreasonable content and discontent. The next list comprises the more common and more obstinate delusions and hallucinations; hypochondriasis; feeling as if not human; feeling criminal, or only fit for prison; hallucinations of hearing—voices, jeers, hootings; hallucinations of sight, smell, and taste; several hallucinations in one patient; 'surrounded by

the invisibles ;' tempted or influenced ; delusions as to influence by surrounding objects ; mistakes about sex and persons."

In reference to the force of inheritance in the prognosis, Dr. Savage thinks that although a simple inheritance of insanity or of neuroses has a great influence in producing insanity, and that idiocy or imbecility may arise in consequence, if the person is not attacked before puberty, even though of insane stock, he or she has a better prospect of at least one recovery than a person without such inheritance.

In a very long and able paper on the *Clinical Aspects of Chronic Bright's Disease*, Dr. Mahomed who is best known to us by his studies in sphygmography, contests the ordinary accepted view as to the sequence of events which result in the increased blood-pressure of chronic Bright's disease. Maintaining that instead of this high pressure being produced by the impeded circulation of poisoned blood, and that this poisoned condition of the blood is due to the imperfect elimination of excrementitious material by the kidneys, the condition of affairs should be reversed, and that the poisoned condition of the blood is the starting-point, first for the vascular disturbances, and second for the kidney trouble. The arguments on which he bases this hypothesis are : 1st, that high arterial pressure is found before there is any sign of kidney trouble ; 2d, that certain poisons which are known to cause kidney disease, will cause high pressure before there are any signs of kidney failure, and even while they may be unusually active ; 3d, that high pressure will often be found in otherwise healthy young persons having a family history of gout or Bright's disease, who will almost inevitably develop the latter ; and 4th, that cases of primary kidney trouble, such as surgical or serofulous kidney, do not have high blood pressure, while cases of acute Bright's disease, "if the poison be acute and temporary," may lose all signs of high arterial pressure during their recovery, even while the kidneys are manifestly crippled. According to this view, then, the high blood pressure and subsequent cardio-vascular changes are the primary and important features of Bright's disease, while the kidney symptoms "are only secondary, and not even essential conditions."

This is an outline of the author's opinion as to the nature of the clinical condition that we recognize as Bright's disease. While we would not be prepared to admit Dr. Mahomed's hypothesis in its entirety, the value of the hope that it extends, that by the early recognition and vigorous treatment of the condition he terms the "pre-albuminuric stage of Bright's disease" the danger may be postponed or perhaps entirely removed, would entitle it to careful study.

R. M. S.

ART. XVIII.—*Lectures on Syphilis of the Larynx, delivered at the Hospital for Diseases of the Throat and Chest, London.—Lesions of the Secondary and Intermediate Stages.* By W. MAC NEILL WHISTLER, M.D., M.R.C.P., Physician to the Hospital, Honorary Physician to the National Training School for Music, etc. 12mo. pp. 88. London : J. & A. Churchill, 1879.

THESE are two lectures delivered at the Hospital for Diseases of the Throat and Chest, London, originally printed in *The Medical Times and Gazette*, and now published, with some slight additions, in book form. They are chiefly based on the author's clinical service in the hospital during a period of five years, many of the cases having been under observation for prolonged periods of several months, some of them, at intervals, for two years.

Lecture I. treats of the earliest manifestations of syphilis in the larynx. After detailing the character of the observations made by a number of laryngoscopists,

the author groups the lesions observed by himself under the following heads, discussed in detail and illustrated by a few clinical histories :—

1. Catarhal congestions simulating those arising from ordinary causes ;
2. Congestions accompanied by *diffuse redness* and *swelling* ;
3. Mucous patches of various types ; and
4. More chronic inflammations, occupying, as it were, the period of transition, the signs of which are *diffuse redness*, *thickening*, and *ragged ulceration*, especially of the vocal cords.

The first two divisions may be dismissed as offering no ground for special comment. Not so, however, with regard to the subject of the development of mucous patches in the laryngitis of secondary syphilis. Before the laryngoscope was employed in the examination of the throat, it was generally inferred that most of the superficial lesions of the laryngeal mucous membrane, in secondary syphilis, were due to mucous patches similar to those observed in those portions of the mouth and throat accessible to direct vision. It soon became evident, however, that these lesions are rare in the larynx, so rare, indeed, that many laryngoscopists have never detected them. Others, again, have observed them in varying proportions. Thus, Dr. Morell Mackenzie "found these lesions in two cases only, out of fifty-two patients whom he examined at the Lock Hospital in 1863 ;" M. Ferras states "that he only saw one out of nearly one hundred cases ;" Gerhardt and Roth "found them eight times in fifty-four mixed cases." Dr. Whistler met with them in twenty-four cases out of eighty-eight suffering with secondary syphilis ; "but in eighty-two cases with later manifestations he did not meet any." The discrepancy in these records is greater in appearance than the reality may have justified, for some of the authorities cited make no mention of the length of time that they had their cases under observation, "an important consideration," in the author's opinion. He states that these patches "may be present at the first laryngoscopic examination, or you may, on the other hand, carry out these investigations on the same patient for many weeks or months before you see one." As Dr. Whistler had unusual facilities in observing a large number of patients for comparatively prolonged consecutive periods, it becomes easy to comprehend that his figures are more likely, as far as they go, to indicate an approximatively accurate estimate of the frequency of the lesions, than results from the single examination of a number of syphilitic subjects at any one time in a hospital, or the usual estimate from the records of cases examined intermittently even in a large private or clinical practice. It is highly probable therefore, that mucous patches occur in the larynx much more frequently than laryngoscopists generally have been willing to admit. An important point brought out in relief by Dr. Whistler's labors, is the fact that all his cases of mucous patches in the larynx occurred in individuals with mucous patches of the mouth and pharynx, or of the genitalia. As to the frequency of variation in seat, it may be noted that the mucous patches were located on the epiglottis in ten cases, on the vocal cords in ten, on the arytenoids in four, on the inter-arytenoid fold in two, and on the ventricular band in two. In one case the glosso-epiglottic fold was the seat of the lesion. For details as to the appearances of the mucous patch as developed upon the mucous membrane of the different component structures of the larynx, the reader must be referred to the original.

Immediately following this lecture are two tables indicating the time from infection to the appearance of laryngeal symptoms, the seats of the lesions, and the concomitant manifestations in twenty-six instances of diffuse redness, and in twenty-four of mucous patches respectively.

Lecture II. is entitled "Relapsing ulcerative laryngitis of the earlier and intermediate periods," and comprises the author's fourth group of manifestations. It

is noticeable that these manifestations of diffuse redness, thickening, and ragged ulceration of tissue have been observed in immediate sequence to the stage of catarrh and of mucous patches, and as late as several years after the primary sore, "when there may be tubercular eruptions limited to the arms or legs, periosteal inflammations, or scars from ulcerating syphilitoids, with ulcers of the fauces and chronic glossitis." By the way, the term "fauces" is so very undeterminate, that it might be advantageously omitted altogether, and be substituted by the name of the special structure sought to be designated. It is evident here, as in many earlier articles on syphilitic laryngitis, that discrimination is not easy between some of the laryngeal manifestations of secondary and of tertiary syphilis, except at limits approaching either extreme. The doubtful period is designated as "*intermediate*" in the volume before us. Lesions making their first appearance several years, "three or four or more," after the primary sore, can hardly be considered otherwise than as belonging to the clinical history of what is understood as tertiary syphilis, while the lesions following closely the period of secondary manifestations are comprised in the latter category, even if delayed a few weeks later than is usual. Secondary manifestations, if neglected or unrecovered from, may merge in time into the tertiary period, with which they then become identified. The first case cited as representative of the intermediate period presented ulcerations and warty excrescences eight months after infection, and directly consecutive to a series of relapses of ulcerations from mucous patches. This case would ordinarily belong to the secondary period. A somewhat similar local result in the second case cited, with a history of sore throat at intervals of about four and eight years from the initial lesion, and first seen with ulcerative laryngitis at a period two years later, or ten years after infection, would ordinarily belong to the tertiary period. It appears to the writer that due allowance is not made for a series of laryngeal manifestations of tertiary syphilis, characterized by extensive ulceration of the soft tissues, and by unhealthy granulations, but unassociated with the perichondritis and chondritis, so frequently developed as late lesions of the disease.

Three reduced drawings of the laryngoscopic image of the intermediate period of syphilitic laryngitis represent very well the thickening of tissue, irregular or notched ulceration of vocal cords and other structures, and the irregular excrescences at the margins of ulcers in the meso-arytenoid fold, as so frequently presented in lesions of syphilitic origin.

The points of similarity and of discrimination between the appearances in syphilis, and the analogous conditions which are associated with phthisis as it involves the larynx, are lucidly alluded to in a few well arranged sentences.

With regard to the special constitutional treatment, small doses of blue mass (one or two grains combined with opium, three times daily) is the mercurial treatment preferred for early catarrhal syphilitic laryngitis; protiodide of mercury is preferred in the more stubborn cases of ulcerated patches with a tendency to thickening; and bichloride of mercury combined with iodide of potassium is indicated as the best remedy for those cases described last. The various methods of administering mercurial remedies are discussed, but do not require comment here.

The topical medications recommended are solutions of chloride of zinc (fifteen or thirty grains to the ounce of water) in superficial congestions, applied every third day in ordinary cases; sulphate of copper (fifteen grains to the ounce of water) in cases of mucous patches; nitrate of silver (one drachm to the ounce) in cases of chronic ulcerations with thickening, carefully applied, not oftener than once a week. Iodoform is recommended as a local application in relapsing ulcerations, either in combination with glycerine or by insufflation. Dr. Whistler appears to expect a good deal from the local use of iodoform, which he is trying

in the form of pastilles and in that of spray. Sprays of chloride of zinc, sulphate of zinc, perchloride of iron (two or three grains of each to the ounce of water), or of alum (five or eight grains to the ounce of water) are recommended for general use once or twice daily. Local applications to the interior of the larynx are rarely necessary, in the writer's estimation, in the forms of syphilitic laryngitis under discussion in Dr. Whistler's volume, the constitutional treatment alone being usually sufficiently effective in controlling the local manifestations. The use of sprays of water impregnated with some agreeable aromatic, as Cologne water and the like, is useful to cleanse the parts and make them feel comfortable, and even pleasantly so, but the advantages from impregnations with active medicinal agents are but exceptionally apparent. When it is evident that constitutional treatment is not followed by amelioration of the condition in the larynx, then topical interference becomes requisite, as it often is when there are large excrescences interfering with respiration, or enormous swelling or oedema producing the same result.

It will be seen that Dr. Whistler has made good use of his material, and that his contribution to the literature of syphilis of the larynx commends itself both to the syphigrapher and the laryngoscopist as specialists, while it places the subject correctly before the general practitioner. The language of the volume is good, the cases are well reported, and there is an air of integrity throughout, which leads us to place a high estimate on the conclusions deduced from the personal observations of the author.

J. S. C.

ART. XIX.—*Porro's Method of Cæsarean Section.*

1. *Della Amputazione Utero-ovarica come Complimenta di Taglia Cesaro pel Dottor Edoardo Porro, Professore Ordinario di Ostetricia e Ginecologia nell' Universita di Paria.*

Utero-ovarian Amputation, as a Mode of Completing the Cæsarean Section.

By DR. EDOARDO PORRO, Professor of Obstetrics and Gynaecology in the University of Pavia. 8vo. pp. 83, 1876.

2. *Contribuzione alla Statistica della Ovaro-isterotomia Cesarea-metodo Porro pel Dott. Egidio Welponer, Assistente alla Clinica di Ostetrica e Ginecologia in Vienna, diretta, dal Prof. Carlo Braun-Fernwald.*

A Contribution to the Statistics of Cæsarean Ovaro-hysterotomy; Porro's method. By DR. EGIDIO WELPONER, Assistant to the Obstetrical and Gynaecological Clinie of Vienna, directed by Prof. Carl Braun-Fernwald. (Lo sperimentale, 6th fasciculus, June, 1877, p. 607, pages 20.)

SINCE the appearance of Prof. Porro's pamphlet, describing his operation upon Giulia Cavallieri in May, 1876, there have been, as far as can be ascertained, twenty-nine additional cases reported, all of them on the Continent of Europe. We have not heard of its having been performed in Great Britain, and we are quite sure it has not been in the United States since 1869.

The operation originated, so far as Prof. Porro is concerned, in this way: On April 27, 1876, a dwarf primipara, of 4 feet 9 inches, entered the obstetrical wards of the Hospital of the University of Pavia. She was 25 years of age, and had suffered severely with rickets in childhood, by which her pelvis was much deformed. At the end of three weeks, May 21, she was taken in labour, the waters broke with the first pains, and after these had continued in all for six hours and forty minutes, the Cæsarean operation was performed by the said pro-

fessor, and a living female child removed. The uterus contracted, but not sufficiently to close the sinuses in the incised portion, and much blood was escaping, particularly from one edge of the wound. Without stimulating the organ to contract by the use of the means ordinarily resorted to, or making use of sutures to stop the hemorrhage, the operator at once decided to remove the uterus, which he did with a strong iron-wire and serre-nœud, placing the loop around the cervix opposite the inner os, and then tightening it. When all escape of blood ceased, he cut away the uterus by means of curved scissors, passed a long drainage tube through the Douglas cul-de-sac, tying the ends together, brought the cut cervix to the abdominal wound, and finally closed the incision with wire sutures. The woman was taken in labour at 10 A. M. Cæsarean operation begun at 4.49 P. M., and lasted nineteen minutes, sutures seven minutes, and dressing eight minutes; nine minutes were required for full anaesthesia.

In four days the *serre-nœud* was removed, in a week all the sutures, and in forty days the cure was complete. After several months, an examination showed that the pedicle of the cervix was over an inch long, and that the woman could walk, run, and jump, without the production of abdominal pain.

Had the result in this case been as it was after the same operation under Dr. Horatio R. Storer, of Boston, in 1869, who was forced to the procedure in a Cæsarean ease by the violence of the hemorrhage, the pregnancy being complicated by the presence of a fibro-cystic tumour, we should probably have heard little more of the new method. But success, after a bold innovation, is everything to its future continuance, and hence the repetitions of the operation, with alternations of success and failure.

If we look back fifty-one years in abdominal surgery, we will find that the celebrated Prof. James Blundell, of London, after instituting a series of experiments upon rabbits, recommended in his lectures at Guy's Hospital the performance of the very operation to which Prof. Porro's name is now attached. As his language is remarkable, and the subject of interest in this connection, we present a few extracts:—

"In speculative moments, I have sometimes felt inclined to persuade myself, that the dangers of the Cæsarean operation might be considerably diminished by the total removal of the uterus. . . . Rabbits are tender animals. . . . If the Cæsarean operation be performed on a rabbit in the ordinary way, it will generally be found (unless I am much mistaken) that the animal perishes in consequence. But in four rabbits, recently delivered, I made an opening above the symphysis pubis, and raising the wombs from the abdomen, I elevated them above the aperture. . . . I took a ligature, with a needle on its centre, . . . and passed it through the vagina." Dividing the ligature, "I tied one half on the right side, and the other on the left, over each Fallopian tube." After which "I completely removed the wombs, cutting, for the purpose, very close upon the ligatures." After closing the abdominal wound by sutures, Dr. Blundell brought the severed portion of the vagina by traction upon the two ligatures, "in contact with the abdominal incision internally." The operation succeeded beyond his hopes. "Of the four rabbits, three recovered; the fourth dying in consequence of the ligatures slipping from their place. . . . In performing the Cæsarean delivery on the human body, perhaps this method of operating may hereafter prove an eminent and valuable improvement. . . . Perhaps you may do something for obstetric surgery here. Let it be remembered, that in securing the vagina and removing the uterus, we are substituting a wound well secured, and of smaller extent, for one that is larger, and not secured by a ligature at all."¹

Thus it will be seen: 1. That Prof. Blundell first proposed the operation, after a series of experiments, which satisfied him of its probable success (he did not

¹ *Lancet*, vol. ii. p. 167, London, 1828.

perform it, for want of an opportunity, but he did remove a uterus with success, in a case of cancer); 2. That Dr. Horatio R. Storer¹ did perform it, in order to save, if possible, a woman from bleeding to death; and 3. That Prof. Porro deserves the credit of having first made a successful gastro-hysterectomy in a parturient woman.

The operation of the Pavian gynæcologist was much condemned in medical periodicals, particularly those from abroad, when the case first appeared; and we are not now prepared to recommend it at home as a substitute for the true Cæsarean section. The woman operated upon by him, after a labour of six hours and forty minutes, might have been saved by the old method; as in almost every parallel case in the United States, as early a resort to the knife has resulted favourably; and believing this, we would not favour a substitute which might, unnecessarily, unsex the woman.

To recommend the Porro method, it will require to be shown, that it can save a larger proportion of what experience tells us are usually unfavourable cases, than the old operation. The arrest of hemorrhage is generally quite a simple matter, where the patient has been but a short time in labour. The chief points of value in the operation we believe to be these:—

1. It prevents the possibility of escape of the lochia into the abdominal cavity.
2. It removes all the sinuses through which septic poisoning usually takes place.
3. It prevents all risk of secondary inertia uteri, and hemorrhage.
4. It diminishes the risk of metro-peritonitis.
5. It admits of direct antiseptic treatment.
6. It prevents the possibility of danger from a subsequent parturition.

What it will do in cases of *osteo-malacia*, as a means of arresting the disease, remains to be seen. It has been claimed by Späth, of Vienna, that it exercises a curative effect; but this requires to be proved. If it will do this, and it is not improbable, as it entirely unsexes the subject of it, then this feature alone will make it of much value in parts of Austria, Germany, and Italy, where the malady is unusually prevalent, as there appears to be no other cure in use.

Dr. Welponer furnishes the following list of the operations that have been performed after the Porro method:—

1. 1876. Prof. Porro, Pavia, one case, successful.
- 2, 3. 1876 and 1877. Prof. Späth, Vienna, two cases, one successful.
4. 1877. Prof. Hegar, Fribourg, one case, died.
5. 1877. Prof. Carl Braun, Vienna, one case, died.
6. 1877. Prof. Chiara, Milan, one case, died.
7. 1877. Dr. Previtali, Bergamo, one case, died.
8. 1878. Prof. Müller, Berne, one case, successful.
9. 1878. Prof. Chiara, Milan, one case, died.
10. 1878. Prof. Tibone, Turin, one case, died.
11. 1878. Prof. Carl Braun, Vienna, one case, successful.
- 12, 13. 1878. Prof. Wasseige, Liege, two cases, one successful.
14. 1878. Dr. Reidinger, Brünn, one case, successful.
15. 1878. Prof. Breisky, Prague, one case, successful.
16. 1878. Dr. Peroglio, Brescia, one case, successful.
17. 1878. Prof. Chiara, Milan, one case, successful.
18. 1878. Dr. Fehling, Stuttgart, one case, died.
19. 1878. Prof. Gustav Braun, Vienna, one case, died.
20. 1879. Prof. Litzmann, Kiel, one case, died.
21. 1879. Prof. Carl Braun, Vienna, one case, successful.

¹ Journ. Gynæc. Soc., Boston, Oct. 1869, p. 223. The woman lived sixty-eight hours.

We make the following additions to this list of Welponer's, viz. :—

- 22, 23. Prof. Tibone, Turin, two cases, one successful.
24. Dr. Peyretti, Italy, one case, died.
25. Dr. Franzolini, Italy, one case, died.
26. 1879. Prof. Tarnier, Paris, at Neuilly, one case, died.
27. 1879. Prof. Tarnier, Paris, one case, successful.
28. Dr. Prevost, Moscow, one case, died.
29. Dr. Fochier, Lyons, one case, successful.
30. Dr. Berruti, Italy, one case, successful.

No. 4 was affected with uræmic convulsions; No. 7 was five days in labour; No. 20 was sixty hours; No. 25 was moribund at the time of the operation; and No. 26 was long in labour; her fetus and placenta putrid and uterus filled with gas; others may have been equally unfitted for enduring the operation.

This shows a saving of 14 women out of 30. We cannot agree with the author, that this is a very wonderful degree of success, when we consider the skill of most of the operators in charge. The record is very defective in some important points, in that it fails to state the causes of dystocia, the number of hours in labour before the operation, the condition of the women at the time of the operation, and the number of children saved.

If, as we presume, from an examination of several of the cases, a large proportion were operations by election, and performed in good season, we cannot see that the success is in any way an advantage over that of the old method, so far as we are concerned. Take the Cæsarean record of our own country with all its cases (111), and many of them wretchedly treated by midwives before the operation, and we show 48 women saved. Compare this with 14 saved out of 30, under the Porro method, and the new would have $46\frac{2}{3}$ per cent. saved, against $43\frac{9}{7}$ under the old operation. But take from our 111 cases the early elective operations, and we make a showing of success far beyond the 50 per cent. claimed by Dr. Welponer and Prof. Tarnier, viz., 20 women, and 22 children, saved, and delivered alive, respectively, in 27 operations.

Prof. Tarnier, of Paris, in reporting his two operations recently before the Academy of Medicine, stated that he had seen reports of 29 cases with 15 recoveries, and that his were the first Porro operations performed in France. We believe the Professor to be in error in his figures, as we have found 30 cases with a mortality of sixteen; so that he should have more than 29 to make up the additional success.

In considering the value of this operation, we must examine it from a European standpoint, where women with deformed pelvis are so frequently delivered in hospitals and so often with fatal results. Up to June 2d, 1876, when Prof. Späth operated upon his first case, every Cæsarean section for a century in the lying-in hospital of Vienna had proved fatal: and up to May 20th last, when Prof. Tarnier did the same at the Maternité of Paris, every Cæsarean case had proved fatal since the year 1787. At the end of fifteen months Prof. Späth stated that his patient had no remaining indications of the existence of malacosteon. Of six operations performed in the Lying-in Hospital of Vienna, three have saved the mothers and five the children.

The progress of this operation among professors and hospital gynæcologists is one of the wonders of modern surgery. In twelve days after Porro operated in Pavia, Späth imitated him in Vienna, and both cases recovered, the children also being saved. The Pavia woman was rachitic, and the Vienna one suffering with malacosteon; in both the labours had progressed but a short time before the operation, hence their success as compared with other late cases on the list, which

have often failed in consequence. From this very encouraging beginning, a little more than three years ago, the news of success has spread until we find 12 operations placed to the credit of Italy, 8 to Austria, 12 to Germany, 2 to Belgium, 3 to France, 1 to Denmark, 1 to Russia, and 1 to Switzerland; the operators being among the leading obstetrical surgeons of these countries, some of them well known throughout the medical world. There has been a great deal written about the operation, certainly more than twenty-five papers and reports of cases. What is still much wanted is a full clinical and historical record of the work already done; distinguishing the hospital from the private cases, the rachitic from the malacosteon, etc., the early from the late, the exhausted from the moderately strong, and the dwarfs from those of average growth.

As far as we are concerned there will seldom be any occasion to perform this unsexing method here. We have no malacosteon to cure by it; have had but four cases out of 111 in hospitals, and seldom have a dangerous hemorrhage or inertia in any early case. If we will persist in the delays of the last ten years it will make but little difference what operation is performed, there must be a frightful mortality, as there has been. To think of 26 deaths in 32 operations is a sad reflection; but the result is not to be wondered at when 24 of the women were not operated upon until it was too late to have any but the faintest hope of success, except in a few instances; their labours lasting from a day to two weeks, and a large number being two, three, and four days under this fruitless and exhausting process. *Eight early cases* tell the story of the last decade's failures in the United States as compared with former periods of the same length. Leave out the entire work of the last decade and we present a record of 53 per cent. of women saved. Our rate of mortality is not an evidence of the real danger of the old operation, it is an exaggeration, begotten of bad obstetrical management on the part of midwives and accoucheurs.

We should do something to remedy this habit of delay, or to render it less fatal in its effects by the use of some new system of delivery, which shall diminish the dangers of the Caesarean section in cases thus rendered desperate.

R. P. H.

ART. XX.—*The Brain and its Diseases. Part 1. Syphilis of the Brain and Spinal Cord, showing the part which this agent plays in the production of Paralysis, Epilepsy, Insanity, Headache, Neuralgia, Hysteria, Hypochondriasis, and other Mental and Nervous Derangements.* By THOMAS STRETCH DOWSE, M.D., F.R.C.P.E., Physician to the North London Hospital for Consumption and Diseases of the Chest, etc. etc. 8vo. pp. 142. London: Balliere, Tindall, and Cox, 1879.

THE fact that constitutional syphilis may and often does attack the nervous system, although well known to many of the earlier writers on venereal diseases, appears to have been forgotten until recalled from oblivion by the researches and writings of Hughlings Jackson, Lockhart Clarke, Hutchinson, and Reade of Belfast. Since then the subject has excited more or less attention among intelligent physicians, as shown by the numerous papers which have, from time to time, appeared in the journals. We cannot, therefore, agree with Dr. Dowse that "the subject is of far greater interest than is usually admitted."

According to our author, the nervous system may become the seat of constitutional syphilis, in consequence of either inherited or acquired instability which makes it the weakest part of the individual; and hence the part capable of making

the least resistance. Thus, a blow upon the head has, in some of the cases which have come under his observation, appeared to be the exciting cause of an outbreak of the disease in the brain or its membranes, just as a similar influence will sometimes determine its localization in an external part—a fact which is as true however of some other constitutional diseases as of syphilis. Not infrequently among the educated classes which furnish a large proportion of the cases, over-study or prolonged mental excitement or depression seems to be a predisposing cause of some potency in the production of cerebral syphilis. Other causes are venereal excesses, and the various debilitating diseases.

Among all the symptoms of syphilitic disease of the brain or its membranes, Dr. Dowse regards headache as the most distinctive and characteristic. In no other form of cerebral growth is the pain so severe as that which results from a gummatous tumour of the dura mater. It is not relieved by pressure; on the contrary, this often increases it. It is, moreover, often remittent and accompanied, he says, by localized increase of temperature. We can confirm the author's statements in regard to the intensity of the pain in cerebral syphilis, having had several cases under our care in which great suffering resulted from it. We could have wished, however, that he had given us the characters by which its nature could be recognized more fully and clearly than he has done.

Dr. Dowse teaches, and we think correctly, that a vigorous mercurial treatment of the primary stages of syphilis renders the liability to a subsequent attack of disease of the brain less than if the individual is neglected or treated in an expectant manner only. He holds, however, and here we think the experience of those who have had most opportunity for observing the disease will bear him out, that it is utterly impossible, no matter how perfectly this treatment is carried out, ever to assert with certainty that there will be no such manifestations. In the later stages he gives the iodide of potassium in large doses—occasionally as much as half a drachm three times a day. In cases where the patient is broken down in health, he prefaches the anti-syphilitic treatment by tonics and nutrients.

The book is evidently the result of much careful study of the disease, and contains the histories of many interesting and remarkable cases. The author's style is, however, bad; many of the sentences being so clumsily constructed that it is not easy to arrive at his meaning.

J. H. H.

ART. XXI.—*Colour-Blindness; its Dangers and its Detection.* By B. JOY JEFFRIES, M.D., Ophthalmic Surgeon, Massachusetts Charitable Eye and Ear Infirmary, etc. etc. 12mo. pp. 312. Boston: Houghton, Osgood & Co., 1879.

THREE papers by Dr. Jeffries on colour-blindness were noticed in the numbers of this Journal for Oct. 1878 and Jan. 1879. The author now publishes the results of his investigations in more permanent form, and gives a complete history of the subject with an account of all that has been done and written by others. Prof. Holmgren's directions for the use of his test are quoted in full. Dr. Jeffries has recently notified us that complete sets of worsteds for making this test can be procured of N. D. Whitney & Co., 129 Frémont St., Boston.

Most of the European governments have taken action in the important matter of excluding the colour-blind from positions in the railway or marine service, where their presence involves the greatest risks, and some of the principal corporations in Great Britain have voluntarily adopted more or less stringent means of

protection; but in this country the subject has hitherto been practically ignored. Dr. Jeffries has the merit of being the first in America to urge its importance. The number of his examinations has reached nearly twenty thousand, and the extent of his investigations enables him to speak with authority. He has succeeded in inducing the Legislature of Massachusetts to take an active interest in the subject, and it has instructed the board of railroad commissioners "to consider whether any legislation is expedient or needful with reference to the employment by railroad corporations of persons afflicted with colour-blindness." It is to be hoped that their report may be in accordance with the teachings of experience and common sense, and that the other States will not long remain behind Massachusetts and the rest of the civilized world.

Dr. Jeffries has repeated the experiments of Prof. Delboeuf, whose paper was also noticed in the number of this Journal for Oct. 1878, with entirely negative results. He does not share the professor's hope that congenital colour-blindness can ever be remedied or relieved.

G. C. H.

ART. XXII.—*Transactions of the American Gynaecological Society*, Vol. III.
for the year 1878. 8vo. pp. 472. Boston: Houghton, Osgood & Co. 1879.

THE volume appears this year in a new and more attractive form, with the same care in character of paper and press-work, so marked in its predecessors. The size of the work is somewhat smaller, 472 pages, but in character of contents, the reputation of the Society has been well maintained. This, from the rigid exactions in admission to membership, will no doubt continue, as the object of its organization is work, without any regard to numbers. In most scientific hives there are a few workers and many drones; but in this one, there is a strong feeling prevalent against having a preponderance of the latter element. Hence in the year past, there was but one admission; high distinction in the profession, especially as a contributor to its literature, being regarded as essential for fellowship.

The annual meeting having been held in Philadelphia, much that was said has been already laid before our readers in this Journal's supplemental publication, *The Medical News and Library* (see number for October, 1878): we shall therefore make but few special comments.

This Society commenced four years ago, with thirty-nine founders; has increased by the election of nine; and diminished at the same time by the deaths of three of the original fellows; leaving 45. Of these, 30 are, or have been professors in medical schools, and 33 are connected with hospitals. In fact, but three of the forty-five are neither professors nor connected with hospital work at the present time; one being a distinguished ovariotomist; another for years a hospital gynaecologist; and the third, well known by his learned and abundant work as a contributor to medical science. It is not then to be wondered at, that the three day sessions of this body should attract a crowd of visitors, or their writings and discussions excite an interest in the medical minds of our country.

In the paper by Dr. James P. White, of Buffalo, upon Extra-uterine Pregnancy, he appears to be of the impression, which is by no means an uncommon one, that it is safer to wait for the indications of nature than to open the abdomen and remove the foetus. It is to be regretted that Dr. T. Gaillard Thomas was not present at the discussion on this subject, as his experience and remarkable successes lead him to hold very opposite views. The fatal results of waiting, in

this city have satisfied a number of our leading gynaecologists that it is safer to operate soon after the death of the foetus than to postpone.¹ Had Dr. Parry lived to the present time, he would have held very different views from those given in his work on extra-uterine pregnancy, which were taken from a more remote experience than we are now learning from.

The discussion of Dr. R. A. F. Penrose's paper on post-partum hemorrhage gives many valuable points in treatment; Dr. Penrose being particularly strenuous for the use of vinegar; but perhaps the best of the modern discoveries, is that of the very decided haemostatic effect of hot water, which has been well tested under the eye, in arresting the bleeding from the raw inverted flap made in the operation for the cure of exstrophy of the bladder. The temperature used in the latter instance is as hot as the hand can bear; in the uterus, it is claimed that up to 115° Fah. may be injected.

Dr. W. H. Byford, in his paper upon "Dermoid Tumours of the Ovary," makes this remark on page 173: "Some one else has propagated the doctrine of inclusion, or of a *fœtus in fœtu*; believing that somehow one ovum had become engulphed in the organization of the other, and on account of the nature of its nidus could not attain to complete organization or development." In the day when dermoid cysts were believed to be either twin or direct conceptions of a foetal character, this may have been a misnomer; but how will Prof. Byford account for such a case as that which came under the care of Dr. John L. Atlee, of Lancaster in 1846, in which a true foetus escaped from the abdomen of a little girl of six, who lived seventeen years afterwards?² The term *inclusion* is not confined to the ovary as a nisus, many cases on record being purely abdominal, located near the stomach, and singularly, in most of the recorded examples on the left side, and often in male subjects.

The paper on "Gastro-Elytrotomy," by Dr. Henry J. Garrigues, of Brooklyn, is well worthy of attention, in view of the fact that this operation is under serious consideration here and in Great Britain at the present time. Dr. G. may be styled the historian of this operation, having reproduced from the originals of Joerg, Ritgen, and Baudelocque, the accounts of the early failures in this form of section. Dr. Thomas has now quite a rival in Prof. Porro, of Pavia, whose operation was performed twelve times last year (1878), with seven successes, in Switzerland, Italy, Germany, and Belgium.

Dr. Theophilus Parvin, of Indianapolis, contributes "Three Cases of Rupture of the Uterus." The question of gastrotomy in these cases has been fully discussed by Dr. Trask, of New York, but so long since that it is virtually re-opened. The mortality after turning and delivery is so frightful that it is a question of moment whether the abdomen should not be opened for the delivery of the foetus in all cases where the uterus has discharged a portion of its contents into the peritoneal cavity, and the condition of the woman is such as to warrant the use of the knife. A search after unpublished cases of this operation has revealed quite a number of failures, and an encouraging list of successes in the United States. Taking Dr. Trask's collection and our own together would much reduce the measure of success claimed by him, as his cases were all published. At one time we were under the impression that about three out of four women had been saved, but more recent disclosures have reduced the percentage. We presume now that the mortality is about the same or perhaps a fraction less than after the Cæsarean section. We believe that case No. 3 was a proper one for the operation, and would probably have recovered, although it is possible she might have done so

¹ See article by the reviewer in this Journal for October, 1878, and by Prof. T. G. Thomas in number for January, 1879.

² Trans. Coll. of Physicians of Philadelphia, 1879.

without resort to the knife, under good nursing. Two similar cases in this city recovered after gastrotomy.

Perhaps one of the most learned controversial papers of the volume is that by Dr. Isaac E. Taylor, of New York, which, as its author was not present, was unfortunately not read or discussed. The title conveys but an imperfect idea of the questions involved: it reads, "On the early delivery of the placenta, when praevia, with the relation of a case of spontaneous separation of the placenta without hemorrhages." After a long *r  sum  * and discussion of the opinions of various observers upon the question of the gradual obliteration of the cervix during gestation, the author advances the confident belief that such opinions were founded in error, and that "it is immaterial to what part of the uterus the ovum is attached, the fundus, the sides, or the tissues around the Fallopian tubes, or the os internum. The internal orifice is as much closed as the orifices of the Fallopian tubes; it grows *pari passu* with the body in that location as in any other." He gives in evidence of the correctness of his views three drawings from anatomical specimens, showing the length of the cervix at eight months in two primiparae, and nine months in a multipara, with the closed appearance of the *os internum*.

With regard to the appearance of the *spot* on the placenta, in cases where it is praevia and central, Dr. Taylor, who has seen fourteen of this class, believes that there is no special characteristic feature, the superimposed cervical portion varying with the condition of the placenta and strength of its attachments.

Dr. Taylor also discusses the question of the action of the cervix in dilatation, denying that it is due to inherent muscular contraction, and claiming that this portion of the uterus is "only an annex; a passive organ." . . . "It is as much prepared physiologically by its passiveness to dilate as the fundus, physiologically is to contract." He also says, "I have in several instances had the opportunity of observing by ocular demonstration this mechanism or behaviour of the cervix during delivery."

Dr. Taylor claims priority in the discovery of the non-development of the cervix uteri during gestation, dating his observations back to 1851. He advocates premature delivery in cases of hemorrhage from placental presentation, occurring in the latter months of pregnancy, *i. e.* in the sixth, seventh, or eighth month. We notice also that he still advocates the use of the tampon, introducing a long strip of $1\frac{1}{2}$ inch bandage, and packing it against the cervix, a plan much condemned by some of our obstetricians in this city, the hot-water irrigation being considered much safer and more reliable, any fresh access of hemorrhage being readily detected where the vagina is not plugged up; and measures for arrest can at once be made use of.

R. P. H.

ART. XXIII.—*The Causes and Results of Pulmonary Hemorrhage, with Remarks on Treatment.* By REGINALD E. THOMPSON, M.D., Cantab., Senior Assistant Physician and Pathologist to the Hospital for Consumption and Diseases of the Chest, Brompton. 8vo., pp. 135. London: Smith, Elder & Co., 1879.

"THE outcome of the physical examination of over twenty-two thousand patients during their lifetime, and of the inspection of three hundred cases of diseases of the chest after the death of the patients," certainly merits the careful attention of the professional reader, especially when it is intimated that he "may find something which is not in accordance with the accepted doctrines of the great masters in medicine." The arguments in the text are enforced by brief

records, in outline or condensed detail, of eighty-three cases, with a few tables of statistics, and several illustrations in colour.

Beginning with a retrospective summary of the views of Hippocrates, Richard Morton, Laennec, Louis, Andral, Graves, Niemeyer, Hertz, and Flint, on the relation between blood-spitting and consumption as cause and effect, attention is called to the difficulties in determining this relation from a clinical point of view, and the propriety of interrogating pathology for a solution of the problem.

The doctrines chiefly combated are the practicability of deciding as to the source of a hemorrhage from the colour and appearance of the blood, and the opinion that haemoptysis, when indicative of pulmonary disease or due to it, is caused by the growth or decay of tubercle. The published views of Dr. Austin Flint, of New York, are frequently cited in corroboration of conclusions drawn from the author's personal observations.

Omitting further allusion to the diverse causes of pulmonary hemorrhage, attention will be confined in this notice to the discussions of its significance as an evidence of phthisis, as the topic of greatest general interest in medical practice.

To appreciate the arguments of the author it is proper to quote the significance ascribed to the terms *phthisis* and *tubercle*.

"Phthisis appears to me to be that form of destructive disease which terminates a variety of pulmonary diseases which have their origin in inflammation and irritation; it is the common result to which these diseases tend to converge, which they may ultimately assume, and in which they lose their initial peculiarities.

"With regard to the use of the word 'tubercle,' it is used here in a limited sense, the nodular form known to Laennec as gray tubercle, which appears to me to be the result of secondary infection, whether it be considered as a general infection of the lungs, as it occurs in acute tuberculosis, or as a more local affection restricted to portions of the lungs. The latter form is that in which it is generally presented to view in the post-mortem examinations of phthisical lungs, and I believe it results in many cases from infection with septic matter, which is derived from a secreting cavity, drawn over the bronchial tubes into the lobules by the force of insuffilation, of which force as an agent, in transplanting matter from one place to another in the lungs, some proof will be given in the following pages.

"It will not be supposed that I mean by this to convey the idea that the bronchial tubes are the only carriers of infective matter, but it would seem that their influence has been overlooked."

The difficulties of deciding from the colour of the blood, whether a hemorrhage originates from the bronchial arteries and capillaries or from the pulmonary veins and capillaries, are shown to be very great, from the fact that both series of vessels circulate arterial blood in health, making it impossible in many cases of trivial hemorrhage to decide from which set of vessels the blood has flowed. For this reason, and for others, our author objects to the use of the terms bronchorrhagia and pneumorrhagia.

All the evidence the author has been able to collect "points to the pulmonary vessels as the usual source of hemorrhage, slight and serious, and the only source of profuse hemorrhage, except in cases of aneurism of the aortic circulation, and of a general hemorrhagic diathesis." The most usual cause of fatal bleeding from the lungs was found to be due to the rupture of aneurisms, varying from the size of hemp seeds to that of small oranges, and in no measure related to systemic aneurisms, but dependent upon local conditions.

The arguments adduced, at different portions of the volume, in opposition to the view that tubercle is the cause of hemorrhage, are based upon the pathological fact that the infiltration of cell-growths into the alveolar tissue, and the consequent compression and obliteration of the bloodvessels rather prevents bleeding

than fosters it, while the liquefaction of the tubercle, resulting, as it does, from a necrosis due to an absence of blood supply, does not cause bleeding even when there is ulceration. No bleeding, it is argued, can be detected in acute tuberculosis, or where compact masses invade large tracts of the lungs when the infection is more local.

The only manner in which it is admitted that tubercle may result in pulmonary hemorrhage is when it may compress a portion of a very small pulmonary vein, block it up, and give rise to a slight capillary hemorrhage; but no instance of the actual rupture has been seen by the author, the usual effect of the blocking being a simple stasis resulting in streaks of black pigment. The opinion is expressed "that bleeding from the lungs appears to stand in no relation to the amount of tubercle, and is independent of it; but the presence of tubercle in large quantities, whether it be in the serofulous lung or in any other form, would suggest the probability that the patient had not been subject to any copious attacks of bleeding during the time of the tubercular process."

The generally received opinion that tubercle is the cause of the hemorrhage is believed by the author to be due to misinterpretation of physical signs which are dependent upon the retention of extravasated blood in the lungs.

In the chapter on pathological traces of hemorrhage, some instructive coloured plates are introduced to exhibit the manner in which portions of the blood are drawn by insufflation into various parts of the lung. Other coloured illustrations represent the alterations which the inhaled blood undergoes after the lapse of a number of months. These changes are absorption, decoloration, fibrination, and calcification. It is denied that evidence has been adduced to show that putrefactive changes take place in these masses. Indeed, it is argued that the filling up of the alveoli, and the clotting in the bronchioles prevent any admixture with air and any special organism that might induce a septic condition; and it is intimated that any risk of the kind is due to the admixture of morbid secretions with the extravasated blood in its passage through the bronchial tubes.

The alterations undergone by the extravasated blood or by the blood residues, is regarded as the connecting link between blood-spitting and phthisis excavation of the lung. These masses may participate in the general destruction following phthisical excavation or liquefaction, at which time the addition of old blood pigment to the secretion from a cavity imparts a green tint to the yellow sputa. The fibrinous nodule left by the absorption of the outermost portion of the clot is believed to form the nucleus of initial softening far more frequently than is generally suspected.

Attention is drawn to the calcareous degeneration of old hemorrhagic nodules, and two characteristic illustrations are given of their aspect, as well as that of the capsules in which they are inclosed, or from which they escape by rupture when located in mobile portions of the lung.

Although the opinion is maintained that tubercle is not due to irritation excited by the extravasated blood itself, it is believed that the liquefaction of the hemorrhagic nodules engenders the risk of drawing portions of the softened products into other portions of the lung by the process of insufflation, and thus tends to the formation of tubercle by repeated acts of infection. The observer is cautioned against mistaking for tubercles certain small nodules, no larger than pin-heads, in the air sacs, and which are harder than tubercles and more opaque, and distinguished at once on microscopic inspection.

The special proclivities to pulmonary bleeding, as deduced from the author's observations, are hæmophilia or tendency to hemorrhage, plethora from imbibition of great quantities of beer or light wines, excessive heat of temperature, and alterations in the blood from the effect of various systemic diseases.

In a number of cases of phthisical families given in illustration, some of which comprise the records of four generations, epistaxis figures prominently as one of the manifestations of the hemorrhagic tendency, and occurred in many of the subjects of blood-spitting. The conclusion arrived at is that a special tendency to hemorrhage prevails in some families as the result of an inherited taint of phthisis. Since the author's attention became directed to the inherited tendency, he has rarely failed to establish the connection in all cases of bleeding where the hemorrhage has been copious, or has occurred during the early stages, or before any pulmonary disease could be detected, or has been due to trivial exertion.

In copious beer-drinkers and the like, it is contended that a hydropic degeneration of the tissues generally ensues, inducing a condition resembling haemophilia, with a tendency to general capillary stasis, and actual degeneration of vessels in marked cases.

The remarkable predominance of haemoptysis during the heat of summer, and under conditions of sudden elevation of temperature, is explained by the expansion of the vessels generally under heat, with consequent increase of intravascular pressure, and diminution of the tenacity of their walls. The importance of climate, and the temperature of dwelling-rooms is shown to be significant in this connection.

The influence of the use of wind-instruments on the causation of hemorrhage has received considerable study, and a number of interesting cases are outlined in an appendix. The author concludes from his own observations, that pulmonary disease is rare as a consequence of playing upon wind-instruments. Indeed, in some of his cases, the exercise of the lungs, consequent on their forced inflation, appears to have really postponed the development of pulmonary disease which became established when the instrument had been laid aside.

The remarks on the treatment of pulmonary hemorrhage are judicious and commendable. Caution is inculcated against too great reliance upon actual styptics. Those most recommended are gallic acid with small doses of sulphuric or nitric acid, and opium; turpentine, inhaled from lint; and ergot in full doses (two drachms of the fluid extract), the liability to deterioration of the drug by keeping, rendering it often uncertain whether failure with it be due to faulty preparation, over keeping, or non-effect. Styptics are not thought of much avail in copious bleeding from delicacy of structure, and here good air is recommended, bracing and rather cold air, air inhaled after its passage over ice, and oil and ferruginous tissues. Stimulants, when necessary, are considered admissible only in the smallest possible bulk. In cases of general plethora, free purging, local and even general blood-lettings are recommended; and it is stated that some cases yield only to blisters.

It is with great pleasure that we recommend the careful perusal of this valuable monograph, which we regard as evidence of real progress in the pathology and etiology of pulmonary hemorrhage.

J. S. C.

ART. XXIV.—*Clinical Lectures on Diseases of the Urinary Organs, delivered at University College Hospital.* By Sir HENRY THOMPSON, Surgeon Extraordinary to H. M. the King of the Belgians; Emeritus Professor of Clinical Surgery, and Consulting Surgeon to University College Hospital. Fifth edition. 8vo., pp. 355. London: J. & A. Churchill, 1879.

IT rarely falls to the lot of a man to store his writings with such wealth that the wisest of his contemporaries are content to mine there for the treasure which

they too would bring to the light. Such, nevertheless, has been the fortune of the author of these lectures. It is well-nigh impossible to write upon the subject of genito-urinary diseases, without referring either to his name or to his many valuable contributions to the special department which he has so well illustrated. Catholic in his investigation of the fruits of the labour of others, cautious in all his deductions, rejecting all specious theories in the effort to obtain practically useful results, as clever with his pen as he is with the sound or the lithotrite, one can scarcely wonder that he is esteemed the master that he is. Of Sir Henry's "searcher" it may well be said that it has proved to be a famous "finder."

At the same time, it would not be expected that the author could embody, in this fifth edition of his clinical lectures, the ripest fruits of his mature and rich experience. In point of fact, he has not done this, nor, under the circumstances, was it possible to do this. None but a great author and teacher should have the privilege of publishing clinical lectures in book form, and men of that high standing really need not do it. Clinical lectures belong to the department of transient literature, and are there best consulted. The author admits that none of the present lectures were written out by his own hand, but were all delivered in a colloquial style, and the words at the time reported phonographically. Thus, they originally appeared in the *Lancet*. They can, therefore, be fairly exempted from the standard of criticism to which a systematic treatise should be subject. In such a light, they deserve to be regarded as admirable expositions of the subjects considered, useful to the student, and occasionally suggestive to the man of broader experience and reading. As setting forth the views of a well-known author, they have, of course, a merit peculiarly their own. He, however, who has once enjoyed a reading of the author's work on the pathology and treatment of stricture of the urethra, and urinary fistulae, or who has learned to appreciate the value of the researches which resulted in the Fothergillian prize essay on *The Prostate and its Diseases*, can scarcely fail to be here disappointed in finding, devoted to the same subjects, scarcely one-sixth of the space required in the treatises named.

The American reader of these pages will naturally seek to discover upon which side of the controversy now waging with regard to the male urethra, Sir Henry Thompson throws the weight of his great authority; nor will he seek vainly. The male urethra, according to our author, is "a continuous closed valve, capable of transmitting fluids and solids in one direction only, and transmitting nothing whatever in the opposite direction, except in obedience to applied force." With reference to those whom Sir Henry, viewing them collectively, names "the mechanical school," he practically condemns, with as much moderation as might be expected of one in his quasi-judicial position, all the knick-knacks and complex mechanical means which are by them used for exploration, incision, and other operations upon the urethra. In short, the weight of his authority is thrown in favour of that conservative recognition of the rights of the urethra, which is, we are glad to believe, making itself felt upon this side of the Atlantic.

Here, for example, is an apothegm, which might well be pressed to the consideration of many practitioners who have not given special attention to the diseases of the genito-urinary organs. It is a voice from one in authority, sounding from the land where every man's house is, by law, regarded as his castle:—

"All instruments are evils, more or less considerable, never to be resorted to unless a greater evil be present, which their employment may probably remedy" (page 42).

The fallacy of supposing every obstruction to the passage of an instrument which distends to its utmost extent the soft, sensitive, and delicate urethral

ehink, to be necessarily a stricture, and to be treated as such, is well shown in the following paragraph (page 34):—

"Now, in considering this subject, I feel compelled to express the opinion that there is a tendency, at the present day, to employ instruments too readily, and instruments also which are liable to injure the urethra. I may be allowed to say, perhaps, that my feeble voice has been raised against the abuse of instruments from the first day that I ventured to pen a line on the subject, some five and twenty years ago. And now I perceive a growing disposition to return to the state of things I have referred to. I note an increased tendency to discover stricture, and especially to undertake a considerable amount of operative treatment for strictures of the slightest kind, and sometimes in cases where, in my opinion, no strictures have existed. There seems now to be a school which has determined for itself a very high standard of patency in what we hear called "the urethral tube," and which is accordingly said to have, or, if it hasn't, that it ought to have, a calibre of so many parts, and very large parts, of an inch, or so many millimetres, as the case may be. Instruments of astounding magnitude are produced, and, if one of them cannot be passed, with an ease which contents the operator, through the whole of the urethra, the unlucky patient is pronounced to be the subject of stricture; and probably he is submitted to an operation by no means devoid of risk."

This, and more of the same general character, is said by our author, in connection with a subject whose importance constitutes a plea for its extended consideration. We are tempted to make further extracts from the pages before us, touching upon the same points, but we have perhaps sufficiently indicated the tendency of Sir Henry Thompson's opinions and the direction of his teaching. His clinical lectures will prove valuable in one way, if in no other, by aiding many who have been fascinated by the brilliant and delusive promise of the "tube system," to return to that cautious prudence which should characterize every man who is a true physician.

Of course, it will be claimed by many that our author, guided by his conservative instinct, has neglected to make use of much valuable material that was at his hand. To this criticism, certainly, he is amenable. Many of the instruments for internal urethrotomy, as modified by our countrymen, deserved honourable mention, even in a collection of clinical lectures. Mr. Erichsen,¹ in the last edition of his comprehensive treatise, does not hesitate to do justice to the Otis urethra-meter and urethrotome, and Mr. Gant² is not unmindful of the value of the Van Buren-Gouley tunnelled shaft.

At the same time, it must be admitted generally that Sir Henry Thompson is prompt to make trial of everything which promises to be of the slightest benefit either to his patients or to his knowledge of their disorders, which are practically one and the same thing. More than twenty-five years ago, he first saw the endoscope, for example, in the hands of Mr. Avery, of the Charing Cross Hospital, and his well-known comment upon the possibilities of its usefulness, has stuck to it like a label ever since: "If a man has a good and tolerably practised hand, with a fair share of intelligence, I do not think he will gain a great deal by the endoscope; and if he has not, I think it will be of no use at all."

We might point to another illustration of the rapidity with which our author seizes and tests the earliest indications of science in the direction which is to him the most interesting. Prof. Edmund Andrews was, without question, entirely original in his application of acoustics in the search for small fragments of stone, before and after the operation of lithotripsy. But he had scarcely devised, employed, and published³ a description of his new auscultating sound, when Sir Henry

¹ 1878, pp. 854 and 864.

² 1878, p. 775.

³ Chicago Med. Journ. and Exam., June, 1878, p. 597.

Thompson, almost at the same moment, upon the other side of the Atlantic, introduced into the bladder a sound with an attached microphone, and made audible to a number of assembled students the instant of contact of the beak of the instrument with the last remaining fragment of a crushed calculus. In his lecture upon this subject, as it appeared originally in England, the experimenter was made to appear as distrustful of the future of the microphone, in this connection, as he certainly was of the future of the endoscope.

It is to be regretted that our author should not have contributed to establish uniformity in the matter of the gauge of urethral instruments. He still reproduces (page 47) the wretchedly defective plate, which has done duty in earlier editions, as "the French or Charrière gauge," and, while praising his neighbours across the Channel for their "exactness," admits that the English measurements are arbitrary and without uniformity. It does not seem to have occurred to him that he was the very man, and his the great opportunity, to take a step which would largely contribute to bringing order out of chaos.

The typographical appearance of the work is all that could be desired; and the cuts are neither better nor worse than those which are to be seen in every American treatise on the same subject.

J. N. H.

ART. XXV.—*State Board of Health Reports.*

1. *Tenth Annual Report of the State Board of Health of Massachusetts.*
Jan. 1879. 8vo. pp. 309. Boston, Mass., 1879.
2. *Sixth Annual Report of the Secretary of the State Board of Health of the State of Michigan,* for the fiscal year ending Sept. 30, 1878. 8vo. pp. lxix. 355. Lansing, Mich., 1878.

1. THE current number of the Massachusetts reports comes laden with an especial and melancholy interest. We hardly expect to be credited when we state that the Massachusetts Board of Health has made its last report! Considerations connected, we believe, with the question as to who shall be the next Governor, have led to some sort of dodge or movement, in the pretended interest of economy, for consolidating all the various Boards, Commissions, etc., into one. Of course it would be presumptuous folly to doubt for one moment that the voters of the Bay State, or its Governor, can find a body of men who shall be equally conversant with sanitation and lunacy, penology and pauperism, chemistry and metaphysics, poor-relief and ventilation. Elsewhere and formerly it has been supposed that different gifts were vouchsafed to different men, and in different measure; but we live and learn.

Dr. Clouston, Superintendent of the Royal Lunatic Asylum, near Edinburgh, contributes a paper describing what he considers an ideal hospital, adapted to the needs of this country, and to accommodate two hundred insane patients. Plans and drawings exhibit the several buildings of this somewhat composite design, both in their relations and in their individual structure. To some of us, it might appear like a rather bold undertaking for a person born and bred abroad, an entire stranger to this country, and never having, we believe, even visited it, to assume the position of instructing native Americans as to the construction of their hospitals. With every disposition to profit by tuition, we are compelled to acknowledge a misgiving that he has failed. Having no practical acquaintance with the ways, manners, and habits of our people, sane or insane, the social status of our patients, our climatic conditions, and, perhaps especially, the finan-

cial light in which all eleemosynary institutions are now very closely criticized, we need hardly say that the writer fails to hit upon such architectural arrangements as should meet the requirements.

Without going much into detail, we may say that Dr. Clouston's deviations from the commoner plans among us, consist in housing the patients in several buildings, about a hundred feet apart, and connected by glass corridors, which are also to be used as winter-gardens, promenades, smoking and exercising rooms, etc. If we understand rightly, all suitable patients, of both sexes, are to take their meals sociably in a large central dining-room, so designed as to give the effect of an arcade surrounded by a conservatory. The wards have, for the most part, rooms on one side only, with windows on the other.

That any advantage of sufficient magnitude to offset the grave objections to the plan is gained by dispersing the patients in the manner here contemplated, may well be doubted. Indeed we have personally no doubt in the matter at all. We hold that in hospital construction for the insane there should be provided every facility for the closest possible surveillance of the employés, especially the nurses. The further these are removed from the officers, the less efficient will be the supervision. In the matter of taking the daily food, we had supposed that the path of improvement lay in precisely the opposite direction to that here suggested. Knowing how offensive to others are the habits of certain patients at meal-time, we have approved the practice of some physicians in substituting for the one or two long tables, groups of smaller ones; thus carrying out the idea of classification, which, singularly ignored in this particular, is so zealously urged by Dr. Clouston in other directions. Indeed, it seems to us as if this matter of meals should be the very last in which the idea of grouping and separation is to be lost sight of.

As to expenditure, judging from the tone of public remark as to costly and "palatial" asylums, we are inclined to think that the *vox populi* would be uplifted against glass corridors, eight or ten feet wide and high, by eight hundred long, for each hundred patients, and fitted up as winter-gardens and smoking-rooms—which of course would imply, in our Northern States, some trifling outlay for fuel. Possibly a portion of the public might fail to grasp the relation between the welfare of the patients and any glass corridors whatever. If Dr. Clouston was at all fully aware of the outcry lately raised, all around us, against costly hospitals, we think he would have modified or omitted this feature of his plan, which at least can make no claims to be economical.

Two years ago there appeared in this publication an extremely interesting and instructive paper, upon the growth of children, presenting tabular statements of the heights and weights of school-children at successive ages. In addition to the principal aim of the observations, the ascertaining of the rate of growth as existing among Boston children, several curious points came into notice as side issues. The writer, Prof. H. P. Bowditch, now endeavours to ascertain the relative potency of *race*, and of *surroundings*, as causes of the superior stature and weight of the children of American parents as compared with those of foreign. It will readily be perceived that the "poorer" class and the "foreign-descended" class, to some considerable extent coincide among our population. It follows that there was, at first, difficulty in interpreting the results. Further investigations seem to show that both factors are active. Among Americans, English, and Irish, the progeny of the prosperous classes are larger and heavier than their less comfortable brothers. But, apart from this, race also has an influence scarcely inferior to that of abundant food, air, and the comforts of life generally. The small number of children of other than American or Irish descent led Dr. Bowditch in his own researches to consider only these two races. It is a significant fact, that

in comparing the poorer with the wealthier class, less difference of physique exists here than in Great Britain.

Prof. Edward Hitchcock sketches, in a very instructive manner, the admirable theory and practice of physical culture and hygiene as obtaining at Amherst College. The faculty justly deprecate that style of education which turns out the consumptive and short-lived graduate of serious aspect and pallid cheeks. For nearly twenty years physical culture has been attended to systematically, under the management of a special professor, who is a regularly educated physician. The aim is not so much to develop athletes as to make the average student healthy, hearty, active, free from dyspepsia, and fitted to work or to play with zeal and pleasure. The amount of actual illness is found to be decidedly less than before the exercises were enforced, to say nothing of the general constitutional improvement. The percentage of sickness decreases with the successive years of college life and study—less in Senior than in Freshman years.

Dr. Winsor treats briefly of the harm done by coal-gas when carelessly, or from imperfect arrangements, allowed to mingle with the air of our homes.

A thoroughly practical paper is the one by Dr. E. C. Clarke, on Common Defects in House Drains. The commoner faults, both of design and execution, are stated, and made clear by numerous wood-cuts.

Over one hundred pages are devoted to a verbatim report of a lawsuit—arguments, evidence, and all—between the city of Cambridge and the builders of a new slaughter-house. We scarcely see why so much space should be devoted to what our newspaper reporters call the “verbiage” of the case, even though it be one of great importance.

Dr. Cowles, of the Boston City Hospital, contributes a Study of Ventilation, giving the results of observations made by him in certain wards of the hospital. By ingenious apparatus, and still more ingenious sectional and ground-plan diagrams, he has ascertained and exhibited complete views of the eddies and currents produced in the rooms by various causes. The temperature and degree of humidity is also shown for different heights and lateral spaces, throughout the wards. From the report of the surgical results, no less than from the findings of the analytical chemist, we are led to suppose the diagrams do not mislead as to the exceptionally excellent diffusion and purification attained. The experiments were made in winter; we wonder if as good results were obtained in spring?

The report on the Health of Towns contains, as usual, many cases of supposed poisoning through contaminated water. A capital circular shows the public, by description and by drawings, the ways in which wells are liable to pollution.

2. The Michigan Board is eminently what is called in the West a “live” organization. It is constantly issuing circulars for popular use, upon prevailing epidemics, prevention of various diseases, different points of hygiene, treatment of sun-stroke, apparent drowning, etc., plainly written in a condensed form, and spread broadcast over the State. From its health officers it requires reports of particular cases or epidemics, liable to endanger public health. Some of these reports are very instructive.

The Board modestly but justly congratulates itself on the almost entire freedom which Michigan enjoys from the elsewhere terribly frequent kerosene disasters. Its rigid inspection of oils has practically abolished these needless tragedies. One danger, however, says Secretary Baker, is not prevented by present law; a lamp perfectly safe under Michigan inspection will become dangerous *if the chimney be broken or removed*,—the metal around the wick soon becoming heated to a point higher than the test.

President Kedzie expresses, we believe, a great truth, in saying that the rela-

tions of climatic conditions to health will be better ascertained by studying meteorological conditions in connection with prevailing diseases, rather than with deaths from those diseases.

In a report on *Lead Poisoning by the Use of Tinned Ware*, etc., Dr. Kedzie states that an alarming adulteration is now very common, by which the wash or plating of tin, covering our common pans and cans, is not pure tin, but mixed with lead. Even tin-lined lead pipe, which we had supposed a safeguard against lead in the water, thus becomes of questionable use. The professor analyzed "bar tin," bought as chemically pure, and found lead in that.

The glazing and enamelling of earthen wares are both open to objection. The first often contains lead; the second cracks, and grease and other matter soak into the pores of the ware, putrefy, and become injurious to health. "Granite ware" he found free from poison; "marbleized ware" was found to contain much lead. By actual experiment, eight ounces of pure cider vinegar took up from a quart basin—marbleized—seven grains of lead in twenty-four hours. A great sanitary want is a perfect lining for kettles, etc., which is of innocent composition, and not liable to separate or crack.

Dr. Hitchcock, of the Board, takes but little space to show the perfect baselessness of the silly notion that tomato eating causes cancer.

The universal use, in Michigan towns, of plank sidewalks, and the frequent presence of large amounts of sawdust in the streets, has given rise to inquiries as to the sanitary influences of decaying wood. Generally, the testimony as to effects is not very definite. A suggestion is made that the turpentine in the cone-bearing trees neutralizes the effects of decay. One gentleman, however, decidedly states that malarial disease in the proportion of 12 to 1 exists in a sawdust-covered district of his town, as compared to a portion not so covered. A considerable excess of cholera infantum and diarrhoea is also noted. Here the sawdust is often overflowed. How much of the alleged facts may be due to other conditions does not clearly appear. Another correspondent believes he can recognize a connection between the sawdust and cerebro-spinal meningitis, though he does not speak with much confidence.

In a report of his attendance on the annual meeting of the American Social Science Association, we are sorry to see so sensible a man as Prof. Kedzie yielding to the notion that the so-called "cottage plan" is the best for curing the insane in this country.

Secretary Baker in his report of his attendance at the State Medical Society meeting, quotes, with tacit approbation, resolutions offered by Dr. J. H. Beech, and adopted, setting forth that the great frequency of homicide, suicide, and infanticide, by persons of impaired minds, should prompt to more care and more stringent regulations for the protection of the public and the afflicted ones from such lamentable results of their freedom. The moral responsibility of physicians, in neglecting to urge proper protective matters, is forcibly stated. It is represented that while the rights of alleged lunatics should be fully respected, honest witnesses should not be liable to legal prosecutions, and thereby deterred from doing a duty and a kindness, or punished if they venture to do it. Even where the case is doubtful, witnesses should not be prosecuted without strong evidence of malice. The resolutions go on to urge the members to warn the public of the frequent danger in keeping insane relatives at home. As a contrast to the vulgar and incessant cry about "incarceration," "conspiracy," and evil motives, these resolutions are refreshing, and should do good.

A report upon outbreaks of diphtheria is introduced by an earnest warning as to the contagiousness of the disease. In a house into which new tenants had just moved, and cleaned out a very filthy cellar, eight cases soon appeared, of which

four died, in a household of ten. The former family had had no trouble, though the cellar and house had been wretchedly filthy.

Another group of nine cases with six deaths occurred. No direct evidence of contagious origin is given. The cellar contained over a hundred bushels of potatoes, which were badly decayed. A candle would not burn on the floor, on account of accumulated carbonic-acid gas. It is suggested that the more deadly oxide was probably present. The water used by the family was intolerably offensive. Two rods south was an unoccupied house with 700 bushels of decaying turnips in the cellar. The inner walls of the occupied house, moreover, were damp from new plastering. From this group, six persons, adults, mostly young, contracted the disease. These, in turn, apparently infected seven children of two of the women, an unknown number of children of the physician, and two children of the second physician. Other additional cases are mentioned as doubtful. Apparently the first family had caused disease in 23 persons. A table here given is said to foot up 35 cases, with 12 deaths; we can make of it only 28 cases.

Another physician reports his knowledge of 73 cases in three adjacent townships—40 in his own practice. Formerly a sceptic as to contagion, he is now fully converted. He traces all the cases to two families. The mortality in this group is not given; in the others it was very heavy.

An admirable popular tract, of three pages, on diphtheria, for popular instruction in prophylaxis, hygienic treatment, disinfection, etc., is here printed.

Another of the practical benefits of the Board appears in the form of an essay on the care and preservation of the teeth. It can be read in ten minutes by the plainest farmer's wife, and if heeded will produce incalculable good. The importance of attention to the deciduous teeth is enforced, in relation to the shape of the jaw, and the position and proper shape of the permanent teeth.

Dr. Lyster has prepared a very good article on the climate and topography of the lower peninsula, or main body of the State. By the numerous maps presented, we see that the climate is curiously varied and modified in different parts. The great lakes which surround the State, in their relations with the most prevailing winds, are probably the principal cause of the eccentricity of the isothermal lines. Dr. Lyster believes, however, that the western winds from the warm Pacific shore do not part with all their warmth in crossing the mountains, but are still able to soften the climate of the lake, and the western shore of Michigan.

B. L. R.

ART. XXVI.—*Diseases of the Bladder and Urethra in Women.* By ALEXANDER J. C. SKENE, M.D., Professor of the Diseases of Women in the Long Island College Hospital; Fellow of the American Gynaecological Society, etc. 8vo. Pp. viii., 374. New York: William Wood & Co., 1878.

A BOOK handsomely printed on good paper, large type, broad margins—the last quite convenient for annotations—its author one of the most painstaking, industrious, conscientious, and eminent members of the American profession, is sure to attract attention. Moreover when the subjects of which it treats are brought under the daily observation of physicians, and are often exceedingly difficult as to therapeutics as they are in diagnosis, the volume is sure to keep the attention which its handsome appearance and the fame of its author have attracted.

Dr. Skene is to be congratulated upon supplying an urgent professional want. We have been looking for this book these many years—nay, longing for it as one anxiously waiting for the morning.

Having ardently desired its coming, and being sincerely grateful that it is actually here, it may seem ungracious to write aught but praise of Dr. Skene's handsome volume, and indeed praise, much praise, can be, should be given. But because the book is good we would have it better; because it fills a vacant place in professional libraries, and must be classed a permanent addition to medical literature, we desire it best. Therefore we shall not hesitate, in justice alike to its honest and able author, and to the profession, to point out some of what we believe its faults, confident that all just criticisms will inure to the value of the book when its second edition appears.

Sidney Smith suggested that it was taking unfair advantage of an author to read his book before reviewing it, the reviewer might thereby become prejudiced! Nevertheless, we have read Dr. Skene's book not once, but twice, and hope we have escaped all prejudice.

In his preface the author states that the lectures which form the volume were originally intended only for the students whom he taught, but the absence of any systematic work, in the English language, on diseases of the female urethra and bladder, led him to believe that the publication of these lectures might be of service to others. Probably the work would be better received by the profession if it were not in the form of lectures. That change made, the "we" which is almost exclusively an editorial prerogative, could hardly find the foremost place it now does; such expressions as "we will now take up and dispose of," and "that you and I may understand each other clearly," and calling blood the "haemetic fluid," would not be tolerated by a man sitting down to the severe simplicity of clear, condensed, plain writing, intended for the reading of doctors; nor would he retain "your anatomies"¹ as the equivalent of your works on anatomy. However, the book now is in lectures, and these lectures we shall briefly refer to in their order. The first is upon *the anatomy of the bladder and urethra, their anatomical relation, function of the bladder, development and malformation of the bladder and urethra*. It would seem according to a natural order in the study to place the development first. However, this is not so material, possibly indeed is a doubtful point. The lecture occupies forty-six pages, has a few illustrations, two of which are taken respectively from Gray and Savage, and is a faithful presentation of the topics mentioned above. However, we do not believe that plexi, p. 8, is the plural of plexus, or that gain is properly substituted for have in the following: "Nerves gain their origin." The following is a sentence found on the second page: "The conflicting views of various authors regarding unsettled questions will, when necessary, be omitted, to make room for the more practical points which you are expected to carry with you to the bedside of your patients." Why *various* authors, and will not opinions be conflicting upon unsettled questions? Would not "to the bedside" be sufficient,

¹ In the Comedy of Errors we read:—

"They brought one Pinch, a hungry, lean-faced villain,
A mere anatomy."

And in King John—

— "Rouse from sleep that fell anatomy,
Which cannot hear a feeble lady's voice."

In Disraeli's *History of the Skeleton of Death* the following sentence is found: "It was at this period that they first beheld the grave yawn, and Death, in the Gothic form of a gaunt anatomy, parading through the universe!"

Surely when Dr. Skene says to students "your anatomies," he forgets his Shakespeare, and also Disraeli's essay. It would be rude to ask whether the "your anatomies," which the students could not help having with them, were "mere," "fell," or "gaunt." It will not do to take a word in use in general literature and give it an entirely different signification in medicine.

without "of your patients?" The words "when necessary" placed where they are, indicate a very different meaning from that intended by the author. There are several sentences in the book equally open to criticism.

In the first sentence on the next page we have the superlative twice used where the comparative should be. On p. 19 we read, "Neither limpid nor concentrated urine are well borne by the bladder," and a few sentences above, "a very thin secretion of mucous," is spoken of. On p. 62, "Neither are to be used in any amount." But these, and many similar errors, are probably to be set down, as "urien," "urethrae walls," and "Archives General de Medicin," etc., to the blame of that unknown individual, the proof-reader. So, too, to this same proof-reader a reckless extravagance in the use of capitals must be attributed; scarcely a page in the book that is not disfigured by the violation of a plain rule and general practice as to capitalization. But we are not willing to blame him with the blunder of concluding a sentence by parenthesis, and the jumble of Latin and of English in the following: "Good effects have followed the use of rectal injections containing Chloral Hydrate (grains 15 to aqua ʒij or ʒij)."

We confess to not always understanding the Latin found in this book, as on p. 33, last clause of the following sentence: "This must be distinguished from Inversio Vesicie cum prolapsu per urethram, and Exstropia from per urachum." Again, p. 39, what does "inversio vesicæ fissuram" mean? If Latin must be given in our text-books, by all means let it be given correctly.

Not only in this lecture, but in some of the others, several authors are referred to, but rarely¹ are page and volume given, and this neglect does not permit those of Dr. Skene's readers, who desire, to consult original sources. On p. 48 we read: "You will find the result recorded by Podruzki." Did any of the students who heard this lecture consult Podruzki's record? Who is Podruzki? Doubtless there is such a man as surely as there was a De Sauty.

"—— Ambulant on Tellus,
Bifid-cleft like mortals, dormant in nightcap,
Having sight, smell, hearing, food-receiving feature
Three times daily patent."

But then where is his local habitation, and in what volume, in what annual, quarterly, monthly, or hebdomadal was "the result recorded by Podruzki"?

The second lecture is chiefly occupied with *functional diseases of the bladder*, but concludes with *extroversion of the bladder through the urethra*. The lecture is excellent, and contains much practical instruction. On p. 54 Dr. Skene refers to what he terms "malarial fever of the urethra." That there is such a disease most practitioners will doubt, and attribute the symptoms, which according to Dr. S. characterize it, simply to derangement of the urinary secretion consequent upon malarial poisoning. On p. 100 an illustration of Dr. Skene's pessary for cystocele is given. The late Dr. Churchill used a Hodge pessary, first giving it an additional anterior bar, and we have sometimes used an inverted and reversed Smith's pessary, but Dr. Skene's instrument is very much better than either plan.

The third lecture is upon *organic diseases of the bladder, urinalgia, exploration of the bladder, vesical hyperæmia, and hemorrhage*. The wood-cuts, pp. 114–117, illustrative of the microscopic appearances of urinary deposits, are poorly done.

¹ Sometimes, indeed, the reference is not given correctly. Thus, p. 64, a reference is made to the Lancet, p. 4, vol. xii. 1875. The publication of the Lancet was commenced in 1824, and two volumes are issued annually. How then can there be a twelfth volume in 1875?

On p. 124 the author remarks that for "physical exploration of the bladder and urethra," he has devised "an Endoscope, which, to the investigator of bladder and urethral diseases, has proved to be what Sims's Speculum is to the gynaecologist." Then follow illustrations and a description of the instrument thus highly commended. Various other most useful instruments, requisite either in the diagnosis or treatment of vesical and of urethral diseases, Professor Skene has devised; indeed he has proved himself peculiarly expert in ingenious and practical devices, though we cannot fully endorse the compliment¹ bestowed upon him by a cotemporary.

The fourth and fifth lectures, probably the most valuable in the volume, are upon *cystitis*. These two lectures are worth the price of the entire book. The treatment of *cystitis* occupies between twenty and thirty pages replete with useful information, much of it indeed original. But after this discussion several paragraphs are devoted to *prognosis* and to *hygiene*. Surely these topics should be presented first.

Vesico-urethral fissure occupies a few pages, and nowhere can a better exposition of the subject be found.

The sixth lecture is upon *neoplasms, foreign bodies in, and hypertrophy and atrophy of the bladder*. In referring to foreign bodies in the bladder, Dr. S. speaks of pessaries badly fitted or worn too long, passing by ulceration from the vagina into the bladder; but he does not mention the fact that in some instances the physician has committed the error of introducing the pessary, Hodge's open lever, through the urethra into the bladder.

Diseases of the urethra are considered in the seventh and eighth lectures. On p. 272 the author gives a representation and description of a simple but ingenious and useful instrument devised by him, called a *reflux catheter*. By this instrument he douches the inflamed urethra with hot water, and finds the instrument quite useful. In discussing prolapse or inversion of the urethral mucous membrane, Dr. Skene states that the few cases of this disorder he has seen were in women over fifty years of age. In contrast with this statement is our own experience, for we have seen only two cases, and these occurred in girls under ten. Certainly, too, that experience would not justify the temporizing treatment which Dr. Skene proposes first, such as reduction of the prolapse, rest in bed, and the local use of astringents. Once a decided prolapse has taken place there is, in our opinion, but one remedy, and that is extirpation. We do not think the author devotes enough space to this operation, and we believe the method of Sequin ought to be presented in such connection—it certainly is ingenious and gives good results.

In an appendix the operation of Dr. Daniel Ayres for a case of extroversion of the bladder is given. Finally, a complete and convenient index concludes this most useful volume.

T. P.

¹ "His instruments are ingenious and to the purpose, and in describing their uses in the physical exploration of the bladder he is *tuto, cito et jucunde*." What can be meant by asserting that Dr. Skene in the exercise of his descriptive or other powers, or under any conceivable circumstances, is three Latin adverbs?

ART. XXVII.—*Transactions of State Medical Societies.*

1. *Transactions of the Ohio State Medical Society.* May, 1878, pp. 228. Columbus, Ohio. 1878.
2. *Transactions of the Medical Society of the State of Tennessee for 1878.* Nashville, 1878.
3. *Ibid.* for 1879. Nashville, 1879.
4. *Transactions of the Kentucky State Medical Society.* April, 1878. Louisville, 1878.
5. *Transactions of the Medical Society of California for 1878 and 1879.* Sacramento, 1879.

1. In the address of retiring President Dr. W. H. Philips, of the *Ohio Society*, expert testimony is considered. We are not prepared to deny that great evils attend the employment of such testimony, or what is offered as such—before our American courts. Brief description is given of methods used in other countries for getting the benefit of expert witnesses. Dr. Philips favours the German system, in which regular medico-legal officers are permanently appointed. A county physician and a county surgeon constitute the tribunal to which all questions of medical jurisprudence are referred by the courts. These gentlemen have shown their familiarity with the subject, and their high attainments generally by passing a rigorous examination, before a Supreme Medical Commission. If the two disagree, or if appeal is made against their opinion, the question passes to a medical commission, one of which exists in every province. A second appeal may be had to the supreme commission, before named. From this body appeal lies only to the Minister of Medical and Sanitary Affairs. The first, or lowest, tribunal makes personal investigation of facts, and may call to their assistance other physicians who have passed the State examinations, and received certificates of skill in the particular specialty involved in the case. The duties of our coroner are also discharged by the two county officials. All this seems to be admirable—for Germany; but impracticable here, where permanency in political office is unknown.

Dr. Muscroft believes the local usefulness of the subsulphate of iron, or “common green vitriol,” has not been fully known. He finds it very useful, not only in erysipelas, but in chronic ulcers, eczema, nasal catarrh with fetid discharges. Used upon wounds, it is antiseptic, disinfectant, and styptic; and when in strong solution for the last purpose not nearly so painful as some other salts.

Dr. C. H. Reed believes quinia to be a true prophylactic as to scarlet fever. Discussion revealed considerable scepticism, on account of the singular vagaries of the disease, and the tendency to fallacious reasoning in such matters.

By using “heroic doses” of the same drug, Dr. Franklin says he lost only one case of yellow fever out of forty-four.

In a report on the progress of medicine, Dr. Loving mentions the fact that in Illinois a law recently passed to regulate medical practice has already produced a stampede of six hundred self-styled doctors who did not care to comply with the requirements. It may be fairly inferred that they left their country for their country’s good.

2. In the *Tennessee Transactions* for 1878, Dr. Richard B. Maury directs attention to the frequency of severe hemorrhage after delivery, from the less considered accidents of parturition; such as lacerations of the cervix, vaginal walls, perineum, and external orifice of the passage. His object is to distinguish this class of blood-losing from that occurring between the placenta and uterine walls.

Dr. S. M. Thompson reports a case of ovariotomy, in which, preparatory to the

ultimate operation, first 58 and again 42 pounds of fluid were removed by two "tappings." The removal of the cyst was done in the open air, two days after the last tapping under chloroform. It was unilocular, and after being emptied of its contents, weighed seventeen pounds. The abdomen was "sponged out," wound closed by five or six sutures, very long adhesive straps, etc. The shock was marked, but under very free (and judicious) use of morphia, with a little whiskey, perfect union took place in six days, and the sutures were removed. We should have mentioned that, under a discretionary order, the patient received an indiscretely large dose or doses, of veratrum viride. Pulse and temperature respectively did not exceed 84, and 100°. The double ligature of saddler's silk was cut off short and left wholly within the abdomen. In twenty days after the operation the woman was seen working in her garden.

Prof. Duncan Eve, of the Nashville Medical College, reports an apparently successful operation in a congenital case of occluded or undeveloped anus, with fistulous communication with the vagina. Further observation is wanting to establish the reality of the cure.

Prof. Roberts, of the same school, advances the idea that the essence of the diphtheritic dyscrasia consists in the consumption of needed oxygen by the morbid fungoid growths, which should have been expended in the purification of the blood and destruction of effete material.

As may be supposed, the treatment advocated is almost purely constitutional. The strongest liquid nutriment, with strong, good coffee, well sweetened and mixed with cream, are deemed all important. Perhaps the secret of the author's alleged success is to be found in this sentence—"When I say I give them nourishment freely I mean that I make them take it. If not *per vias naturales*, then by enema." Quinia is early given if, as he says is usual, a malarial tendency exist, or if the bodily temperature be high. The night hours are deemed most available for the curative exhibition of this drug. Chlorate of potash, lemon juice, and honey are given. Alcohol is discarded upon the idea that its use diminishes the oxidizing powers of the blood.

A most appreciative obituary sketch of Prof. Paul Fitzsimmons Eve, M.D.; adds to the value of this publication. Dr. Eve fell dead while visiting a patient. He was about 73 years of age; had felt somewhat feeble and unwell previously, but declined to rest, saying he would rather wear out than rust out.

3. In the *Tennessee* pamphlet for 1879, Dr. Penn advances a theory, not too well defined,—as to a connection between the malarial fevers and a disturbance of the bodily electricity, which he seems to attribute to free evaporation of watery vapour.

A statement made by Dr. Lindsley, is, we fear only too true, that eye disease is co-extensive and correspondent with early book education of our lads and lasses. Too early application to printed lessons, and faulty arrangements of light in school-rooms, are chiefly blamed for the existing tendency.

Dr. Thornton, of Memphis, believes that yellow fever attacks the patients a second time much more commonly than is usually supposed. He has had personal experience of a second illness, and therefore is at least entitled to a respectful hearing. He thinks the disease is essentially what Dr. Jacob Bigelow calls "self-limited," and of course advocates such treatment only as shall be palliative as to distressing symptoms, and supporting as to the vital powers. He believes a blood-poisoning by a peculiar miasm exists; and the indications are to support the constitution through its terrible ordeal, and to assist reaction and recovery. Quinia he advises only at the very outset of the disease, if at all. Later, he deems it absolutely harmful. Diaphoretic measures, external and internal, and diuretics are advocated. Ice and ice-water are not recommended. To regard

this fever as "malarial," in the common acceptation of the term, our author regards as a mistake in theory and very hurtful as to practice. An instructive table is presented of the recorded details of 143 cases. Pulse, temperature, and brief circumstances are here shown in tabular form. The pulse seems often remarkably low as related to the temperature. With the latter at 103°, 104°, 105°, and even 106°, the former sometimes did not reach 90, even in fatal cases. Some cases only occasionally reached 80. One patient who recovered, in spite of black vomit, shows the following record on successive days: 1st, 72 and 105°; 2d, 88 and 104°; 3d, 60 and 102.5°; and later, never more than 84 and 101½°. Another case, fatal, had a pulse never over 72, and at times 64. In a "recovered" case, 60, 70, and twice 62, with 92 as the maximum. A negro of thirty went through the disease successfully without getting a pulse above 70.

Dr. Hope, of Chattanooga, disbelieves in the direct contagious communication of the yellow fever. Several other brief papers indicate the great attention unhappily given of necessity to the subject. And a noble list of martyrs attests the devoted bravery of the local and neighbouring medical men in combating this terrible pestilence. Sad it is to know that this year is repeating the dread history of 1878.

4. The modest pamphlet from the *Kentucky Society* is very brief. The chiefly noticeable point is an appreciative and well-written memorial of the late Dr. Yandell, Sr., by Dr. Cowling; Dr. Eve, too, formerly of this State, receives a fitting tribute.

5. President Orme, of the *California Society*, in an able address, deals with the great modern evil of adulteration; with preventive medicine; and with the culture of the einchona tree in California. The propagation of the eucalyptus tree, and the establishment of a botanic garden are here also advocated. A State medical library, as well as a State hospital for consumptives, are urged, it seems to us, with less reason.

Some useful records of climates in the various counties, stretching so far from north to south, and climbing from the shore up to the summits of the foot-hills, are of value to the invalid or to his adviser.

A somewhat long paper by Dr. Barkan, on the "Relations Existing between Diseases of the Eye and General and Special Diseases," is instructive. The writer states that it is, to some extent, an abridged translation from Foerster, of Breslau.

B. L. R.

ART. XXVIII.—*Diseases of the Throat and Nasal Passages: A Guide to the Diagnosis and Treatment of Affections of the Pharynx, Esophagus, Trachea, Larynx, and Nares.* By J. SOLIS COHEN, M.D., Lecturer on Laryngoscopy and Diseases of the Throat and Chest, in Jefferson Medical College, Philadelphia, etc. etc. Second edition, revised and amended. 8vo., pp. xviii., 742. New York: William Wood & Co., 1879.

THIS excellent work is again before the profession in an edition which has been enlarged by 160 pages of printed matter and 75 new wood-cuts. Instead of fifteen chapters we now have seventeen. The chapter on Sore Throat from Burns and Scalds has been omitted, whilst chapters on Chronic Sore Throat, Affections of the Septum Narium, Surgical Operations upon the Larynx and Trachea, and Affections of the Laryngo-Pharyngeal and of the Glosso-

Epiglottic Sinuses have been added. The anatomy and histology of the larynx, as well as the description of the nasal mucous membrane, have been omitted. In many chapters we notice amendments, omissions, additions, and a more methodical arrangement of the various subjects treated of than in the previous edition. At the end of the volume the pages devoted to bibliography have not been reprinted, because, as the author states in his preface to the second edition, "it would have sacrificed many pages devoted to clinical use, and has become the less necessary on account of the appearance of copious references in the collateral portions of Ziemssen's *Cyclopaedia*," and in the current reports supplied to well-known medical journals by Prof. Lefferts and Drs. Knight, Porter, and Sémon. Although, as we have stated above, certain anatomical and physiological details have been omitted in this edition, which appeared in the first, yet the author has wisely introduced in certain portions of his greatly improved work, facts taken from Luschka and other foreign authors, with respect to the intimate structure of the organs treated of, with which the close and accurate student could hitherto alone become familiar. We notice the absence of several familiar illustrations which appeared in the first edition, but we have as a compensation many new ones introduced into the body of the work, which materially add to its value. In spite of the appearance of several new works on diseases of the throat within the past two years, we continue to believe that the work of Cohen is really needed by practitioners as a reliable guide to the diagnosis and treatment of these and allied affections. Dr. Cohen has had a very extensive experience in the practice of his specialty, and is, therefore, perfectly authorized to speak in an *ex cathedrâ* manner. This he does, as he himself expresses it, in accordance with "an honest endeavour to interpret facts and observations as they appeared in the light of his own understanding," and as an outcome of this way of doing, he has made the best book on the subjects treated of in the English tongue, in fact we might say without any exaggeration, the best treatise on the throat that has yet been published in any language. His symptomatology is usually complete, his anatomy and pathology fully up to the times, and his therapeutical counsels always manifold and judicious. Wherever we turn in this work, we find the evidence of conscientious and thorough investigation. Dr. Cohen has not contented himself with his own great mine of clinical research, he has also properly utilized the important facts made known by contemporaneous writers. But notwithstanding he has done this, he has so stamped his work with his own impress, that it obviously belongs to him, not as a compilation of what others have done, but as a candid exposition of a great deal of his own efforts and results.

Thus it is, that a work is in our hands, so different from many others nowadays, that it is indeed "a record differing in some respects from the records of others," but is also one written *de bonne foi*, and which characterizes a sturdy pioneer in the cause of truth and science. We cannot sacrifice space to a detailed examination of the numerous excellencies contained in the various chapters, and we shall, therefore, content ourselves with a few allusions to the additions and amendments which have most forcibly struck us in the perusal of this volume. After a succinct description of acute tuberculous sore throat, an affection which the author has never seen, the following interesting case is narrated:—

"I have seen one case of acute phthisis commencing with acute laryngitis, attended with febrile phenomena of distinctly remittent type, occurring in a sailor, twenty-six years of age, after a few days' exposure to severe weather on shipboard. It terminated fatally in two weeks. The lungs were studded with tubercles as were the liver and some other organs. The larynx exhibited a series of follicular ulcerations, similar to those observed in cases of the ordinary ulcer-

tive laryngitis of tuberculosis; but careful microscopic examination failed to reveal any deposit of tubercle in the larynx."

The italics are our own, but as we have had occasion to observe a very similar condition of things three or four times in as many years, during our service in a large city hospital, we are glad to have corroborative proof of our own conviction, viz., that acute miliary tubercle does not become developed in the laryngeal structures.

We do not see the improvement in naming chronic *follicular pharyngitis* chronic *folliculous sore throat*, and we are forced to criticise the stress laid upon the cauterization or splitting of each enlarged follicle as a satisfactory method of treatment. These, and similar curative measures in this disease, are based, in our opinion, upon an erroneous conviction with respect to the true significance of these follicles, whose hypertrophy does not always afford proof of a diseased condition. In many instances, we are satisfied that they had better be permitted to remain in a perfectly quiescent state, instead of being inflamed with nitrate of silver, or London Paste. An interesting page (212) has been properly given to deformative adhesions of the soft palate, and our only regret is that the author did not consider it advisable to give us his experience more at length, in the surgical treatment of these troublesome conditions. Just in proportion as we find certain subjects insufficiently spoken of, or not described at all, in classical general works of medicine and surgery, do we expect and wish to find them fully narrated, and perhaps illustrated, in special books, and are always disappointed whenever our just expectations are not entirely satisfied. Under the head of Treatment of Adenoma at the Vault of the Pharynx (p. 262), the author gives a wood-cut of his pharyngeal cutting forceps, which is modelled upon a somewhat similar instrument of Mackenzie, and which is employed by him to cut off laryngeal growths. The shank of Dr. Cohen's instrument is curved, so as to be adapted to the parts where it is manipulated. "When the vegetations have been long I have been able," says the author, "to pass a wire loop over them, introduced through the nostril, and then drawn the free ends through a Gooch's canula, and thus ent them through." He is far more positive than formerly in regard to the power we have of so completely destroying these vegetations, as to render their repullulation most improbable. The article on Tuberculous Laryngitis is one of the most complete of the entire work, and reflects great credit upon the writer, as being a lucid, and, we believe, correct summary of a very much debated, and, until the appearance of this work, somewhat obscured disease. We are glad to find in this edition sections upon "Primary Chondritis and Perichondritis," "Lupus," "Lepra," and "Hypertrophy of the Larynx."

The appearance of the Larynx in Lupus (Tuerck) is given graphically at page 519, and that in Leprosy (Elsberg) at page 532. The cases of Elsberg are still fresh in the minds of many readers, as having appeared in full in the *Med. Record* (Jan. 4, 1879), to which they are referred. In the article upon Stenosis of the Larynx and Trachea, Schroetter's method of dilating stenosis of the larynx is well described, and a good illustrative figure (p. 591) accompanies the description. In speaking of this method of overcoming laryngeal stenosis by dilatation, the author states that he lacks personal experience in the procedure. In the cases reported by Schroetter and others, although some have been entirely cured, others have been compelled to wear the canula indefinitely, and were only in a certain degree ameliorated.

In place of a section on "Aphonia," which is, properly speaking, the term applicable to a symptom, we now have a complete article on the "Motor Paralyses of the Larynx." The surgical operations upon the larynx and trachea, such as laryngotomy, tracheotomy, catheterization, and exsection, are succinctly de-

scribed. We would have liked to see a wood-cut of Gussenbauer's artificial vocal apparatus appear rather than Luer's pea-valved tracheotomy tube (p. 679), which we can scarcely consent to believe is "noiseless and attracts no attention." A much more complete index than the one of the first edition is found at the end of the work. The type, illustrations, and general appearance of the work are most creditable to the publishers.

In concluding this criticism of a work of so much merit and so few imperfections, we take a just pride in recommending it most heartily to practitioners and students. It is far better to purchase a work of this kind and have a really sufficient idea of the diseases of which it treats, than to stock one's library uselessly with a smaller work which, though cheaper in the beginning, gives no adequate information and cannot be referred to with the hope of surmounting difficulties.

B. R.

ART. XXIX.—*A Manual of Psychological Medicine, containing the Lunacy Laws, the Nosology, Aetiology, Statistics, Description, Diagnosis, Pathology, and Treatment of Insanity. With an Appendix of Cases.* By JOHN CHARLES BUCKNILL, M.D., Lond., F.R.S., F.R.C.P.; formerly Lord Chancellor's Visitor of Lunatics; and by DANIEL HACK TUKE, M.D., F.R.C.P., Joint Editor of "The Journal of Mental Science;" formerly Lecturer on Psychological Medicine at the York School of Medicine, and Visiting Physician to the York Retreat. Fourth edition. 8vo. pp. 815. Philadelphia: Lindsay & Blakiston, 1879.

THE third edition of this valuable work having been somewhat fully noticed in the October number of this Journal for 1874, we propose to comment upon little else than the changes made in the matter or the arrangement since that date.

In the first chapter, upon Legal Enactments, legislative acts are more fully quoted, and the later laws are added. We do not understand why the authors have omitted, in this edition, a guarantee proposed in the third for the protection of the signers of certificates of insanity. Some such measure is certainly needed, but is possibly impracticable. On the subject of classification—always one of great difficulty—considerable change has been made.

The remarks on "Moral or Emotional Insanity" are considerably altered, with more copious quotations. Indeed, the chapter has been pretty thoroughly re-written. The first impression received is, that the writer is skeptical as to the existence of insanity without intellectual disturbance. Finally, however, he guardedly admits the possibility of such cases; but says that "sooner or later" intellectual derangement will almost always appear—if closely looked for. That may be true enough in general; but the writer's experience must have been exceptional if it has not shown him cases where for months, or even years, no impairment of intellect can be detected that would warrant a certificate and a committal to a hospital.

Under the heads of Pathology and Histology, the results of recent observations are the cause of various alterations in the text. In enumerating the changes which may be found in minute cerebral bloodvessels, vitreous degeneration is a condition first mentioned in this last edition. A reference to thickening of the coats of the small vessels omits, in this edition, mention before made of the longitudinal fibres. In naming the morbid changes of the cerebral cells, simple atrophy, mentioned in the former edition, has no place here.

Under "Treatment," the paragraphs on chloral-hydrate seem to have been

wholly rewritten. The author regards it as a valuable adjunct, or palliative; though it is not easy to tell exactly how highly he esteems it. At all events, in this edition, he places it below the bromide of potassium in therapeutic value, whereas, formerly, he seemed inclined towards a different estimate.

We looked with some curiosity into the chapter on Restraint, hoping that the progress of opinion since 1874 might have produced some noticeable change, but not a word added or omitted did we find. That Dr. Bucknill should be strongly impressed with the correctness of his views on this subject, and bring forward all possible arguments in their favour, is natural enough, and we would be the last to object to it. What we do object to, however, is that his manner of presenting these is that rather of the advocate than of the judge. The student has a right to expect, in a work like this, a full and candid discussion, in which both sides of the subject should be fairly presented. For anything he sees here, he would never suppose that the practice of complete non-restraint is regarded by many who have had as long an experience as our author, as a grave mistake; believing the arms of attendants to be a poor substitute for some simple apparatus in canvas or leather, and, indeed, often ineffectual and sometimes causing grievous injury to the patient. Should not the reader have been informed that the extreme non-restraint practice has found few advocates in France or Germany, and none at all among the hospital men of this country, while in Great Britain much of the support which it received—and which is far from being unanimous—is founded rather on a deference to a popular sentiment than upon sincere convictions of its real superiority.

In the revision, every sentence and even every word seems to have been critically examined. As a whole, the volume is a monument of faithful, conscientious work; although, as before stated, we think that upon at least one matter it is somewhat unfair—we are sure, unintentionally.

B. L. R.

ART. XXX.—*On Regressive Paralysis (Infantile Paralysis. Spinal Paralysis of Adults).* By WILLIAM H. BARLOW, M.D. 8vo. pp. 88. Manchester: J. E. Cornish, 1878.

UNDER the title of Regressive Paralysis the author considers the disease heretofore known as infantile paralysis or myelitis of the anterior horns. He has selected this name because it expresses one of the most prominent features of the affection; that is, the retrocession of the paralysis which always takes place in every case. The name is a good one, but it is hardly worth while to rechristen a disease which is well known by other equally appropriate terms. The brochure is based upon sixty-three cases of the infantile form of the disease, which have been carefully studied and analyzed. The author's conclusions confirm those of previous observers in almost all particulars. The paralysis he believes to be reflex in its nature, but he accepts the views of Charcot as to the morbid anatomy of the disease. He has remarked the influence of season in the production of the paralysis, and finds that of 53 cases 27 occurred in the months of July and August. This fact taken with the universal observation that children between the ages of one and two years are most liable to the affection, led the writer to the conclusion that the disease was reflex in character; for he says it is "at this age that the nervous system is most excitable, and when from the process of development, and the evolution of the teeth the whole system is most readily affected by outer influences, when diarrhoea, convulsions, and other reflex troubles are most com-

mon," and in the months of July and August children are most liable to diarrhoea and other disorders of a reflex character.

Nothing new is suggested in the way of treatment except a light apparatus as a substitute for the "heavy Scarpa's shoe." The idea of a light apparatus is most excellent, but we are unable from the description to make out what the instrument is like.

The cases are detailed at length at the end of the paper. Some are rather doubtful examples of spinal paralysis. For instance Case 5, in which there was left hemiplegia with right facial paralysis, and all the muscles responded to the Faradic current, or Case 30, where, after convulsions, there was also left hemiplegia with palsy of the right side of the face. These cases look like paralysis from a cerebral lesion.

All contributions to the literature of so important and interesting an affection as the one before us are very desirable, and we congratulate the author upon the thorough and painstaking manner in which he has done his work.

W. S.

ART. XXXI.—*Die Hautkrankheiten für Aerzte und Studirende dargestellt von*

**Dr. GUSTAV BEHREND, pract. Arzte in Berlin. Mit 28 Holzschnitten.
12mo., pp. 569. Braunschweig. Verlag von Friedrich Wreden, 1879.**

***Skin Diseases Described for Practitioners and Students.* By Dr. GUSTAV BEHREND, etc.**

DR. BEHREND does not, we believe, hold any public position, and he is known in this country only as an occasional contributor of papers upon diseases of the skin to the medical societies and journals of Germany. He tells us in his preface that although the book was undertaken at the request of the publisher, yet he had for some time been accumulating materials with the object of writing a work which should be of use to the student and practical physician, and for which a need in his opinion existed. In this matter we are disposed to agree with Dr. Behrend, for neither the classic work of Hebra nor the more popular treatise of Neumann are calculated for every-day practical use, and there has been sore need in Germany of treatises like that of Duhring in this country and Fox in England, which, while representing the actual state of dermatology, should be compendious and useful in every-day practice.

We rise from the perusal of Dr. Behrend's book with the conviction that he has succeeded in his object, and has produced a work both convenient in size and easy to handle, and containing a surprising quantity of information with regard to the various diseases of the skin and their management. In two respects Dr. Behrend is particularly fortunate. He manages to preserve for the most part a due proportion in the description of the various affections, giving to each the prominence due to its relative importance, and eliminating all extraneous matter, and he writes in a style unusually condensed for a German, and yet at the same time perfectly lucid and very interesting.

The earlier part of the book is taken up with a description of the anatomy and physiology of the skin, the primary and secondary lesions, diagnosis, etiology, therapeutics, and classification. Under the head of internal remedies the author speaks of arsenic, mercury, and iodine alone, regarding all other remedies of a general character as insignificant and not strictly directed against the skin affections for which they are usually given. He speaks with just scorn of the now, happily, extinct notion that it is dangerous to cure a skin disease too

quickly, a superstition which has too often been taken advantage of to hide the ignorance of the practitioner desirous of putting a good face upon a failure to cure severe cutaneous disorders.

Under the sub-head of external remedies, water, soap, sulphur, tar, caustics, and fats are considered; their general effect and the conditions to which they are applicable being in each case indicated.

With regard to classification our author follows Hebra pretty closely, and this we think leads him occasionally into positions which are almost absurd, as where Class II., being "anemias of the skin," his plan compels him to devote a separate section to this, although there are no anemias of the skin as distinct forms of disease.

We think he is mistaken, too, in devoting valuable space to the sub-class of "contagious exudations," which includes measles, scarlatina, variola, and varicella, subjects better and more thoroughly treated in works on general medicine. Again, Class IX., "ulcers," has, it seems to us, no adequate *raison d'être*. Ulcers are either the result of traumatism, when they come under the care of the surgeon, or they are the result of a process which is itself the essence of the disease, the ulcer being simply one of the symptoms or a step in the disease process.

Part II. is occupied with an account of the particular affections. Of these pictures of disease we may repeat what was said above, that they are in some degree models of terse and lucid description, almost all the essential points in the anatomy, etiology, diagnosis, prognosis and therapeutics being briefly stated.

Among the subjects especially worthy of mention is that of artificial eruptions, including medicinal rashes, which are very well described. The others, excepting the appendix on syphilis, which is trifling, are of even and high merit. We regret to observe that Dr. Behrend holds to the obsolete and perplexing custom of naming the various syphilitic eruptions after diseases which are called to mind by the appearance of the lesions, as *acne syphilitica*, *varicella syphilitica*, etc. This unscientific plan tends to produce confusion.

Dr. Behrend's devotion to his master, Hebra, leads him sometimes into what seems an undue exaltation of merely local measures of treatment, and we occasionally find that the internal remedies applicable to a disease are scarcely or not at all noticed. This is particularly observable under acne and eczema, where internal measures, which, in our experience, are frequently alone sufficient to cure, are scarcely alluded to. No wonder our author says of acne that it is hardly ever curable.

The author's ignorance of American literature has given occasion to numerous lacunæ in his descriptions of diseases which have been particularly investigated in this country, and the prominence of obscure German names with the almost total absence of quotations from distinguished American authors is one of the signs of that unfortunate parochialism which has injured the progress of medical science in France, and sometimes appears to threaten that of Germany.

One more criticism we must be permitted upon the extraordinary wood-cuts, which are the vilest imaginable, and have hardly a parallel outside of the quack pictures of skin diseases seen in our daily papers. It is a misfortune that so good a book should be so wretchedly illustrated.

A. V. H.

ART. XXXII.—*A Manual of Midwifery for Midwives and Medical Students.*

By FANCOURT BARNES, M.D. Aber., M.R.C.P. Lond., Physician to the General Lying-in Hospital, and to the British Lying-in Hospital, etc. etc. 12mo. pp. 201. Henry C. Lea, Philadelphia, 1879.

THIS is, as its name implies, "a manual," and small enough to be carried in the pocket of a midwife, to whom it more particularly belongs. The volume is illustrated with fifty wood-cuts, generally taken from the works of Drs. Playfair, Tyler Smith, and Robert Barnes; and these are much better than those usual in books of this class. We do not approve of the recently-adopted English custom of writing "after Playfair"—"after Barnes," etc., under the pictures taken from the works of other authors, unless it is certain that they were original with them. In this manual, such an apparent credit is given to recent authors for illustrations that have been handed down for thirty years or more. We recognize very familiar pictures, from the works of Ramsbotham and others, marked with the names of recent writers. Fig. 27 ("after Playfair") was used by the late Prof. Hodge in 1841, in the form of an oil painting, as an illustration for his lectures; and it was then a copy. The same may be said of Fig. 32. Fig. 3 is in Tucker's Midwifery, a compiled manual of 1848. There are original pictures in the works of Playfair, Robert Barnes, and Tyler Smith, which it might be well to credit to them if known to be such, but we do not see the necessity of a general credit, when such has already been given in the preface. Dr. Robert Barnes is very particular that his own designs shall have "R. B." after them, and was quite severe upon Playfair for leaving out the ("after Barnes") in the first edition of his midwifery; so we presume the son feels called upon to credit all around, whether there is a claim or not. It would puzzle one to find out who originated even half of the designs used in obstetrical books. We have seen pictures of instruments thought to be modern, that certainly existed before the year '70; and we know of others claimed as new, that have their likeness in very old books.

Dr. Barnes's manual having been prepared under the advice of experienced writers, contains many of the things most important to be known by midwives, and obstetrical students about to learn the management of labour cases practically. We confess, as we have before stated, that we are not much in favour of what are called manuals. Few men have the power of condensation to such a degree, as to enable them to produce a little book, with the contents of a large volume: subjects will be sacrificed to space, and matters of moment omitted. The work is well printed on tinted paper, and is a credit to the publisher and printer.

R. P. H.

ART. XXXIII.—*American Health Primers.* 32mo. Philadelphia: Lindsay & Blakiston, 1879.

1. *Hearing, and How to Keep It.* By C. H. BURNETT, M.D. Pp. 152.
2. *Long Life, and How to Reach It.* By JOSEPH G. RICHARDSON, M.D., Professor of Hygiene in the University of Pennsylvania, etc. etc. Pp. 160.
3. *The Summer and Its Diseases.* By J. C. WILSON, M.D., etc. etc. Pp. 160.

THIS series of hygienic tracts, of which the three little volumes named are the earliest issues, bears a striking resemblance both in form and design to those just noticed.

Dr. Burnett's work upon the Hearing and How to Keep It, will not be, and probably was not designed to be, especially edifying to medical readers. Considered as written for the laity, it seems to convey sound professional knowledge in very simple and every-day words. There was undoubtedly room for a work of this kind. As a rule, people think or care very little about the sense of hearing until they begin to suffer from its decadence. Parents especially stand in need of an intelligent appreciation of the tendency to ear-troubles after certain diseases of children, and which may become manifest only after medical attendance has ceased. To watch for, guard against, and take prompt measures for removing such troubles, requires information not usually possessed except by readers of some tract like this before us. And the need is not much less in the case of adults. Few men detect, or pay much heed to, impairment of hearing in its early and curable stages. Indeed it is surprising to notice how frequently almost total loss of function in one ear may exist without detection.

Dr. Richardson's contribution to the series is certainly free from one or two traits possibly open to objection in one of the numbers of the English publication elsewhere noticed. If there the writer be in some places above the popular comprehension, here he may possibly be thought to somewhat unduly underrate the average reader's understanding.

The several chapters deal, in a very matter-of-fact way, with points connected with health and consequent longevity. If the people at large can be induced to read anything of this kind, we should think that this "American" series—so far as issued—stood at least as good a chance of securing profitable attention as its English competitors under a similar title. No one chapter seems to call for special mention. All are sensible and practical. The passages which point out the peculiar liability of the aged to certain diseases, such as head or heart affections, in connection with extreme cold weather, are well put, and should be useful in causing special care at such age and season.

The third number of this series has especial merit and value, as compared with the English series; for it deals with troubles common enough here, but almost unknown in the comparatively cool climate of the British Isles. It could scarcely be expected that any English physician, lacking foreign experience, could write intelligently as to the diseases peculiar to the American hot season. Therefore, with all respect and appreciation for the English publication, we may claim superior merit as to this one subject, at least, for the "American" Primers.

While no young physician can afford to despise the instructions here given, the matter is, of course, principally designed for the typical, intelligent, common-sense citizen, who insists on thinking for himself, and "knowing the reason why." The characteristics of the American summer climate are fairly brought out. Its peculiar dangers are described, and its remedial measures suggested in a manner that any American layman will understand,—though possibly even a highly educated English physician might fail to appreciate the exact situations described. The conditions seem to be quite different in the two countries.

The author takes a common-sense view of "cholera infantum," and cognate maladies. The Rules for Management of Infants during Hot Weather, as distributed for several summers by the Philadelphia Board of Health, are here reproduced,—and of course endorsed. We can well conceive that,—attention once secured to them,—these rules may be extremely useful. Physicians, we think, should take more pains than they do to direct the attention of parents to such tracts as the one just named.

The chapter on fevers, malarial and continued, contain about all that the unprofessional reader could profitably peruse. Water, the air from marshes, and sewer-gas, are all noted as causing febrile diseases. The philosophy of the matter

is simply and well set forth, and precautions against contraction of intermittents, as well as the general palliative treatment of febrile symptoms, are sensibly described.

"Summer colds and hay asthma" are treated in one chapter. The writer thinks that a "cold" usually lasts longer in summer; and seems perhaps to intimate that the floating pollen of plants may protract a common "cold," as well as originate the specific maladies known as "hay-fever," "rose-cold," etc. He gives some countenance to the notion that common catarrh may be contagious.

In dealing with the specific catarrh just named, it seems to us that the author is not precisely accurate in saying that "our knowledge of the nature of the cause is very much more exact and definite than in most other diseases." The onset comes—in each case—at a painfully definite period, and the sequence of symptoms is disagreeably exact; but we scarcely perceive how the adjectives apply to our general knowledge of the causation of the malady. While naming the pollen of the grasses, and of Indian corn, as observed causes, Dr. Wilson seems to imply that numerous plants may exert the same unpleasant power. In naming places where habitual sufferers escape their expected affliction, he omits to mention Eastport, Maine, with its delicious summer coolness and delightful scenery.

The skin, with its summer affections, is well treated. Freckles, sunburn, prickly heat, chafing, etc., are sensibly described, and the principles of cure clearly set forth. Judicious measures are suggested for insect bites, and for poisoning by the "wild ivy."

The fact that Dr. W. W. Keen, of our city, is editor of the series, is ample warrant for the excellence of the numbers yet to come.

B. L. R.

ART. XXXIV.—*Pott's Disease, its Pathology and Mechanical Treatment, with Remarks on Rotary Lateral Curvature.* By NEWTON M. SHAFFER, M.D., Surgeon in Charge of the New York Orthopædic Dispensary, etc. 12mo. pp. 82. New York: G. P. Putnam's Sons, 1879.

THIS little volume with a long title has apparently been written for the purpose of opposing the use of the plaster jacket, which has come into general use with such astonishing rapidity. In these days the desire to hear or to tell some new thing is as active as at Athens in the days of Paul, hence the free discussion of any novel method of treatment is to be encouraged, that one may not be carried away by undue enthusiasm for that which is new. The author devotes the first chapter to the pathology, and the second, which is the final one, to the treatment of spinal caries. He also incorporates a few remarks on the pathology of rotary lateral curvature, which he states has a specific pathological cause and not merely a mechanical etiology; he claims to have demonstrated from a clinical standpoint that a simple non-specific loss of muscular equilibrium cannot explain the phenomena of a typical, rotary lateral curvature.

He lays a good deal of stress upon the occurrence of reflex muscular spasm as a symptom of spinal disease, and says it is a remarkable fact that a prolonged reflex spasm of certain muscles either of the spine or limbs may exist without any history of pain. The importance that this spasm acquires in diagnostic value must be evident, though it is to be remembered that it relaxes under the use of anæsthetics, and then as a symptom of disease fails.

In considering the treatment of spinal caries he says he differs from those who believe that Pott's disease is traumatic in its origin, and hence quite easily cured.

Mechanical treatment should not be used with an idea of overcoming the muscular resistance, for it cannot be entirely annulled by any mechanical device; and, moreover, he has in some cases seen suspension aggravate the lesion, increase the subsequent muscular resistance, and intensify the pain. He holds that the change produced by suspension is apparent rather than real, and that the increase in height noticed is due to the extensibility of the unaffected structures and the modification of the compensatory curves. Recumbency in the prone position for a few moments will produce all the "separation" required to cause a diminution of the injurious pressure or contact of the vertebral bodies.

The gist of the book may be gathered from a recapitulation of the advantages claimed for the antero-posterior support, and a statement of the objections to the plaster jacket. The antero-posterior support, as he uses it, he says, acts scientifically upon the principle of the lever with the fulcrum at the point of disease, it is easy of adjustment, comfortable to the patient, can be readily removed at any time by placing the patient in the prone condition, does not interfere with respiration or transpiration, and finally is clean and light. The plaster jacket on the other hand is believed to be objectionable because it is heavy and dirty, it covers a great area of skin, is apt to cause excoriations that may not be discovered, it requires the patient to be suspended at every change or removal of the dressing, and fails in the majority of cases to accomplish the objects for which it is applied. He states, moreover, that it can only be of advantage in cases of disease below the seventh dorsal vertebra.

The relation of some illustrative cases and the exhibition of some wood-cuts, showing the apparatus recommended, completes the volume. Though the plaster jacket has undoubtedly been received with too extravagant praise, it possesses more merit than would seem apparent from a perusal of the book before us; and, if the porous felt and other forms of laced euirass be considered, it must be admitted that many of the disadvantages of the plaster dressing are removed without impairing its efficiency in properly selected cases. The book is of value because of its containing a good many practical suggestions, but it presents a somewhat one-sided view of the question.

J. B. R.

ART. XXXV.—*Clinical Lectures on Diseases Peculiar to Women.* By LOMBE ATHILL, M.D., Univ. Dub., Master of the Rotunda Hospital, Dublin; Consulting Obstetric Surgeon of Adelaide Hospital, etc. Fifth edition, revised and enlarged. 12mo. pp. 342. Philadelphia: Lindsay & Blakiston, 1879.

FEW books of its size have been so generally and highly commended by critical reviewers as this little work of Dr. Athill's, now in its fifth edition. In the ordinary sense it is not a manual, as its size would indicate; but it is the concentrated essence of the knowledge of one who has become wise by reason of long and well-digested experience in the subjects treated; having had opportunities such as fall to the lot of but a small proportion of the workers in our profession. We are not partial to the class of books ordinarily denominated *manuals*, which are apt to be *little* in more senses than one; being too often compilations of an inferior grade. Neither are we given to praise large and comprehensive works, because they are such; when all that is valuable and practical might have been condensed in half the space. Dr. Athill has reduced his work by making it simple and practical, avoiding historical and speculative matters, and confining his remarks to the more common maladies of women; illustrating them by refer-

ence to cases in his own hospital and private practice, and giving to the reader the methods of treatment that have been found most effectual in ameliorating the condition or curing the case.

The American edition is neatly printed, and illustrated, making a creditable volume. We can very cordially recommend the work to American practitioners, whether beginners in the profession or advanced in the study of medicine.

R. P. H.

ART. XXXVI.—*On Diseases of the Stomach, the Varieties of Dyspepsia, their Diagnosis and Treatment.* By S. O. HABERSHON, M.D. Lond., Senior Physician to, and late Lecturer on the Principles and Practice of Medicine at Guy's Hospital, etc. Third edition. 12mo. pp. 324. Philadelphia: Lindsay & Blakiston, 1879.

THIS volume is chiefly a running commentary on the varieties of dyspepsia, unenumbered by scientific and pathological facts, such as impress their characteristic value on the author's estimable work on Diseases of the Abdomen, noticed in the last issue of this Journal. It is written in diffuse language and is cut up into twenty distinct chapters. Sufficiently free from technical terms to be comprehended by the intelligent invalid, there is much collateral disquisition on topics well understood by the average medical reader, and of questionable necessity in a monograph strictly intended for professional perusal.

Not less than ten chapters are employed to describe as many varieties of dyspepsia. These are preceded by six chapters on general subjects relating to diseases of the stomach and their treatment, and are followed by four on degeneration, ulceration, cancerous disease, and spasm of the stomach, respectively.

Exception might well be taken to loose construction of sentences, numbers of which are so indistinct here and there, as to be incomprehensible or misleading. Thus, the term dysphagia indicates difficulty in swallowing, even when the action of the oesophagus is not impaired; the endermic or hypodermic method of medication does not consist in local injections into the skin; the hypodermic use of medicines "for the production of general symptoms," is vague; no indication is given of manner or method by which "in some cases an electro-galvanic current will act as an effectual stimulant to the enfeebled muscles" when the healthy tone of the abdominal tract has been impaired by too free use of purgatives; and so on. These unsatisfactory expressions would not elicit special comment were it not that the author's position is such that his readers have a right to expect circumspection in whatever he prepares for their study.

As an expression of the results of long personal experience in both hospital and private practice, conveyed in agreeable, though not always perspicuous diction, this contribution of Dr. Habershon has a special value of its own, and in so far is entitled to the favourable consideration of the practitioner, as is already testified by a demand for a third edition.

J. S. C.

ART. XXXVII.—*The Student's Guide to the Diseases of Women.* By ALFRED LEWIS GALABIN, M.A., M.D., F.R.C.P., Assistant Obstetric Physician and Joint Lecturer on Obstetric Medicine to Guy's Hospital, etc. 12mo., pp. 370. Philadelphia: Lindsay & Blakiston, 1879.

DR. GALABIN is the Hon. Librarian of the London Obstetrical Society, and well known as an active gynaecological worker in the same organization. The little book before us is a neat specimen of book-making, and although professedly intended for the undergraduate in medicine, is well adapted to instruct the general practitioner in those diseases of women which he is most frequently consulted about. The size of the volume is not due to a superficial treatment of a large number of subjects, but to the exclusion of those which usually make the great bulk of large treatises on gynaecology, such as the requirements of the specialist demand. For the general practitioner, in regions where there are no specialists, and in cities, where all should be informed upon the ordinary maladies, this will be found a valuable practical work.

Those who desire to study the various ingenious operations for the cure of perineal rupture; and the fistulae between the bladder and uterus; vagina and bladder; and rectum and vagina, must look elsewhere for them, as Dr. Galabin has confined his work to the following subjects, viz.: External and internal explorations for diagnostic purposes; Physiology of menstruation; Malformations of uterus and vagina; Displacements of pelvic viscera; Hyperplasia, Atrophy, Hyperæmia, and Inflammation of the uterus; Uterine growths; Diseases of ovaries, Fallopian tubes, uterine ligaments, and adjacent peritoneum, and cellular tissue; Diseases of the vagina and vulva; and Functional and Symptomatic disorders.

These subjects have been well treated, by one who draws from his own experience, and appears to be blessed with the capacity to express his ideas clearly, without verbal superfluity. The book might readily have been made much larger, without expressing any additional ideas, or adding a particle to its practical value. It is not a perfect treatise, but is of much value in teaching the management of the common maladies of women.

R. P. H.

ART. XXXVIII.—*Etiologie et Pronostic de la Glycosurie et du Diabète,* par le Dr. JULES CYR. 8vo. pp. 172. V. Ad. Delahaye et Cie. Paris, 1879.

In estimating the value of the various conditions which have been urged as predisposing and exciting causes of diabetes, and the etiology being determined, in forming a prognosis in any given case, Dr. Cyr lays great stress on the importance of distinguishing between *glycosuria*, by which he indicates simply the emission of saccharine urine, without regard to its quantity, concomitant symptoms, etc., and *diabetes mellitus* with its well-known train of phenomena. The former, he considers, may be regarded as a simple exaggeration of a normal function, as instanced in the transitory condition produced by "sugar-puncture," while the latter is a glycosuria plus additional phenomena. His studies are undertaken with a view of determining the etiological conditions which distinguish these forms, or which may cause the passage of one into the other. His essay is a methodical analysis of the various statistics and theories which have been published on this subject, while he has himself brought forward no new facts, and his conclusions do not differ from the opinions generally entertained.

R. M. S.

QUARTERLY SUMMARY
OF THE
IMPROVEMENTS AND DISCOVERIES
IN THE
MEDICAL SCIENCES.

ANATOMY AND PHYSIOLOGY.

Inequality in Length of Lower Limbs.

Dr. J. G. GARSON, Anatomical Assistant at the Royal College of Surgeons, England (*Journ. of Anat. and Phys.*, July, 1879), has measured with great care the lower limbs of 70 skeletons of various ages, from 12 years and upwards, of various sexes, and of various races, and has confirmed the observations of Drs. Cox, Wm. Hunt, and J. B. Roberts, of Philadelphia, as to their inequality in length. Dr. Garson took great pains to ascertain that the bones of each skeleton measured belonged to the same body and rejected all those that were doubtful. In 10 per cent. only did he find the right and left limbs of equal length, and of these there are only two cases in which the femur and tibia of one side corresponded respectively to the femur and tibia of the other. In the remaining five cases, it was by compensation that the limbs were equal; *i.e.*, the tibia being shorter where the femur is longer, or *vice versa*. Dr. Garson found a greater tendency to variation in the femur than in the tibia.

In 25 instances, or in 35.8 per cent., the right limb was longer than the left, the average preponderance of the former over the latter in these cases being 3.3 mm. In 38 instances, or in 54.3 per cent., the left was longer than the right, and its average preponderance over the right is 4.8 mm. The left limb, therefore, was not only more frequently longer than the right, but the difference between the limbs was greater, on an average, when it was the longer than when the right was the longer, the greatest preponderance of the right limb being 8 mm., whereas that of the left was 13 mm. Over the whole 70 cases, the left limb was $1\frac{1}{2}$ mm. longer than the right.

The inequalities in the length of the limbs do not, as far as Dr. Garson's observations go, seem to be confined to any particular age, sex, or race.

The Duplication of the Functions of the Brain.

M. LUYS has presented to the Académie de Médecine an important and voluminous memoir on this subject, of which the following are the conclusions. 1. In the normal condition of the functions of the brain, its hemispheres are endowed with a certain autonomy. 2. The left hemisphere, which is quicker in its development, is also that which presents the greatest mass. In general it surpasses its fellow in weight by from five to seven *grammes* (78 to 108 *grains*). 3. While

the cerebral lobes, from the point of view of certain combined psychical operations, act synergically, there are, on the other hand, a certain number of circumstances in which this united action ceases to occur. Thus in the action of articulating sounds and of tracing written characters with the right hand, in oral language or in written language, it is only the left hemisphere which enters into action. 4. In the act of playing musical instruments, and the piano in particular, cultivation creates artificial conditions of cerebral activity, in virtue of which each lobe acts singly independently of its fellow, not only as regards psychomotor phenomena but also in regard to mental operations for the purpose of reading and music, accomplishing operations of judgment, and controlling co-ordinated motor acts. 5. In the domain of mental pathology, the aptitudes natural to the autonomic activity of each cerebral lobe are susceptible of being revealed with remarkable energy. In the insane, the difference in the weight between the mass of the cerebral lobes is much greater than it is normally. The disturbance of equilibrium between each of them is much more strongly marked. It is the right lobe which in these cases appropriates to itself the nutritive activity. The difference, instead of being seven *grammes*, rises sometimes to twenty-five and thirty *grammes* without any destructive lesion. In certain cases of insanity, those suffering from hallucinations with lucidity, or in lucid hypochondriacs, the coexistence of lucidity and of delusion may find a rational explanation in the integrity of one cerebral lobe and the morbid overgrowth of certain regions of the opposite one. In a certain number of such cases, M. Luys has ascertained that the morbid process was unilateral and manifested by an unusual projection of the paracentral lobe. These facts seem to demonstrate the possibility of the coexistence of hallucination and lucidity. 6. Besides the cases thus signalized, there are a great number of psychopathic states, impulses, alienations with consciousness, in which the disorder can have no other rational and truly physiological explanation than a temporary want of harmony between the two cerebral lobes, one of which performs its functions irregularly, whilst its fellow is in a normal condition. 7. With regard to the prognosis of mental diseases, the survival of lucidity and its persistence being well ascertained, there may be deduced from it conclusions of a certain importance, for this symptom would imply the persistent integrity of one lobe only with all its dynamic aptitudes; and reciprocally the absence of lucidity, ascertained in a precise manner, would imply the simultaneous and parallel invasion of the two cerebral lobes. In fact, it is known that the majority of persons suffering from hallucination, who at the outset are lucid during a certain time, at last cease to be so; and at the end of several years, by the natural evolution of the morbid process, they end by being completely insusceptible to excitation from without and more or less deprived of the comprehension of all that passes around them. In cases of this kind, the lesions affect equally the two hemispheres, and dementia reveals itself with its character of absolute incurability. 8. The theory, in a word, of the duplication of cerebral activity may give a rational explanation of certain morbid phenomena of mental disorders, which up to the present time have remained in the dark for want of sufficient data calculated to make them prominent.—*British Med. Journal*, June 7, 1879.

MATERIA MEDICA AND THERAPEUTICS.

Menthol; a New Antiseptic.

Menthol, or peppermint camphor, is a crystallizable body deposited from Chinese oil of peppermint on exposure to cold. It is met with in the form of small colour-

less fragrant prismatic crystals, not unlike sulphate of magnesia. In fact, when first imported from Japan, some twenty years ago, it was for a time suspected to be nothing but Epsom salts flavoured with peppermint. It is now known to have a definite chemical composition, and to be the camphor, or stearoptene of peppermint oil. It is but slightly soluble in water, although it imparts to it its characteristic smell and taste. It dissolves readily in alcohol and ether, and in oils, both fixed and volatile. It melts at about the temperature of the body, and when further heated volatilizes without decomposition. From a series of experiments recently undertaken by Mr. Archibald Duncane, a student of the University of Edinburgh, it would appear that it is possessed of antiseptic properties similar to those of its homologue, thymol. At present it can hardly be regarded as a commercial article; but it could be readily imported from Japan, and there is no reason to suppose that its price would be prohibitive. An impure sample sent over from Canton, in 1872, was valued at 30s. a pound. We are not aware that it has been used in therapeutics; but strong oil of peppermint painted over the part has long been a favourite mode of treatment in China for gout and neuralgia, and it might prove useful in these complaints. The Japanese "Po-ho-yo," or neuralgia remedy, probably contains menthol.—*Lancet*, June 7, 1879.

Pelletierine as an Anthelmintic.

This substance, the active principle of the pomegranate root bark, has lately been somewhat extensively employed on the Continent as a remedy for tape-worm (*tænia inerme* or *medio-canellata*). It is used in two forms, as sulphate and as tannate. To determine which of these is the more active, M. BERENGER-FERAUD made a long series of trials of each; he now embodies the results of his investigations in the following propositions:—

1. The tannate was successful (killed the worm and brought it away *entire*) in 12 out of 14 cases; in the two remaining cases a certain measure of success was obtained, only the heads of the worms could not be found.
2. The sulphate produced the desired effect only 7 times in 20 cases.
3. The tannate seems preferable to the sulphate, therefore, not only for the reasons just given, but also because it is less apt to cause nausea and vomiting, and because, to a higher degree than the sulphate, it favours the action of the purgative by which it is followed.
4. The dose of the tannate of pelletierine should vary from 40–50 centigrammes (6–7½ grains)
5. It should be taken in one dose, early in the morning, the last meal of the previous day having consisted of milk and bread.
6. It should be followed in a quarter of an hour by a purgative of tincture of jalap, castor oil, or sulphate of soda, as seems best in the particular case. Dr. B. is of opinion that a motion of the bowels should be obtained as soon as possible after the remedies have been given, and he advises the adoption of measures which will tend to produce this effect, as it has seemed to him that the chances of the head of the worm being expelled are the greater the more rapid and complete the purgative action.—*Glasgow Med. Journal*, August, 1879, from *Bull. Générale de Théráp.*, July 15, 1879.

On the effects of Chloroform, Ethidene, and Ether, on Blood-pressure.

The Committee of the British Medical Association on the Action of Anæsthetics report (*British Medical Journal*, June 21, 1879) that the facts obtained from their researches seem to warrant the following:—

1. Both chloroform and ethidene administered to animals have a decided effect in reducing the blood-pressure, while ether has no appreciable effect of this kind.

2. Chloroform reduces the pressure much more rapidly and to a greater extent than ethidene.

3. Chloroform has sometimes an unexpected and apparently capricious effect on the heart's action, the pressure being reduced with great rapidity almost to *nil*, while the pulsations are greatly retarded or even stopped. The occurrence of these sudden and unlooked for effects on the heart's action seems to be a source of serious danger, all the more that in two instances they occurred more than a minute after chloroform had ceased to be administered and after the recovery of the blood-pressure.

4. Ethidene reduces the blood-pressure by regular gradations, and not, so far as observed, by sudden and unexpected depressions.

5. Chloroform may cause death in dogs by primarily paralyzing either the heart or the respiration. The variations in this respect seem to depend to some extent on individual peculiarities of the animals; in some, the cardiac centres are more readily affected, in others, the respiratory. But peculiarities in the condition of the same animal very probably have some effect in determining the vulnerability of these two centres respectively, and they may both fail simultaneously.

6. In most cases, respiration stops before the heart's action; but there was one instance in which respiration continued when the heart had stopped, and only failed a considerable number of seconds after the heart had resumed.

7. The use of artificial respiration was very effective in restoring animals in danger of dying from the influence of chloroform. In one instance, its prolonged use produced recovery, even when the heart had ceased beating for a considerable time.

8. Under the use of ethidene there was on no single occasion an absolute cessation either of the heart's action or of respiration, although they were sometimes very much reduced. It can, therefore, be said that, though not free from danger on the side of the heart and respiration, this agent is in a very high degree safer than chloroform.

9. These results confirm and amplify those stated in a previous report, to the effect that ethidene does not compromise the heart as does chloroform. By the method of experimentation then employed, the effect on the blood-pressure could not be determined; and altogether the results here obtained are more exact and unequivocal.

It may be added that since the last report ethidene has been given to a number of patients of all ages, with results which may be described as satisfactory. Given freely at first, it produced anaesthesia as rapidly as chloroform, and the effect could readily be kept up by comparatively small subsequent doses. The only drawback is that in some cases it produced vomiting; but it has not been determined that it does so more frequently than chloroform, over which it has the further advantage of producing less excitement and being more agreeable to the patients.

Isobutyl chloride was given to three patients, but it produced considerable excitement and proved an imperfect anaesthetic.

In concluding this report, the Committee would express the belief that, so far as purely physiological tests go, ethidene has proved itself as efficient an anaesthetic as chloroform, and a much safer one. It is not asserted that this agent ought at once to replace chloroform in practice; but it is believed that a very strong case has been made out for an extensive trial of it. It is impossible for the Committee, having numerous other engagements, to give the agent that extended trial in actual practice which is desirable; and they would ask those who are engaged in practice to use it in their cases, and to report the results they may have obtained.

Nitrite of Amyl.

The exact amount of vascular dilatation produced in frogs by the inhalation of nitrite of amyl has been carefully investigated at Heidelberg by Dr. GASPEY, who has detailed the observations in Virchow's *Archiv*. On the uninjured tongue of the frog the dilatation occurred immediately in both arteries and veins, and increased during the first two minutes. The duration of the dilatation depended upon the duration of the inhalation; if the latter was continued for two minutes, the dilatation lasted from ten to fifteen minutes. The amount of dilatation was at least one-third of the original diameter of the vessel. The rapidity of the blood-current remained about the same; in the first movement after dilatation it appeared somewhat quickened, but always quickly returned to the normal. In order to ascertain whether the nitrite of amyl acts upon vessels which are already dilated by some other means, irrigation of the frog's tongue with a solution of salt was employed, which is known to cause dilatation of the vessels and retardation of the blood-current. Amyl nitrite was found to still produce its effect, although in less degree—amounting to about one-fifth of the original size of the vessel. Experiments on the effect of the amyl in distant parts showed that the changes in the web of the frog's foot differed somewhat from those observed in the tongue. The dilatation occurred in about the same time, but was slighter. There was an immediate but very transient increase in the rapidity of the blood-current, followed by a distinct retardation.

Another point investigated was the effect of the amyl on tissues in which inflammation is going on. Its action on an inflamed tongue was found to be essentially the same as on the uninjured tongue, thus confirming an interesting observation of Mr. Talfourd Jones that hemorrhage after injury may be increased by the amyl. Other observations on the frog's mesentery showed that the process of inflammation was not in the least interfered with by the inhalation. The migration of the white corpuscles was not lessened. It is known, however, by the experiments of Thorma and Appen, that as a rule, whatever accelerates the blood-current lessens migration, and whatever retards the blood-current favours migration. It seems, therefore, that the influence of amyl nitrite on the inflammatory process may be different according to the position of the part, since retardation of the current was observed in the frog's foot and was not observed in the tongue.—*Lancet*, Aug. 9, 1879.

Quebracho, a Palliative Remedy in Dyspnoea.

Dr. F. PENZOLDT, of Erlangen (*Berl. Klin. Wochenschrift*, No. 19, 1879), narrates some experiments both on man and animals with a new drug, the bark of *Aspidosperma quebracho* (*Apocynaceæ*), sent from Brazil, where it is reputed to have antipyretic properties. The form of preparation used throughout was a watery solution of an alcoholic extract of the bark, ten parts of the latter being percolated with one hundred of alcohol for several days, and the liquid filtered, evaporated, dissolved in water, again evaporated to dryness, and the residue dissolved in twenty parts water.

The main results obtained in frogs were complete motor paralysis of central origin, respiratory paralysis, and diminished frequency of the pulse, independent of irritation of the vagus. In rabbits and dogs, motor paralysis and dyspnoea, increasing with the dose administered, were noticed. The dyspnoea in the rabbit, however, appeared to depend on retardation and deepening of the inspirations; while in the dog the inspirations were accelerated. In the latter, also, there was salivation.

Experiments on animals with artificial fever, produced by injecting putrid fluids, showed no decided reduction of the temperature, and hence quebracho is probably not, as was supposed, an antipyretic. It should be added that it is not an anti-septic, but only temporarily retards putrefaction. The results obtained in actual cases of fever in men were also negative, but Dr. Penzoldt thinks that, considering the close chemical relationship between the alkaloid "aspidodermin" which Baeyer has extracted from quebracho-bark and quinine, the subject requires further working out in this direction.

By the accidental observation of a patient with pleurisy and emphysema, on whom the antifebrile effect of quebracho was being tried, Dr. Penzoldt was led to try the bark in various forms of dyspnoea, depending on emphysema, bronchitis, phthisis, pleurisy, etc., and obtained remarkably good results. A teaspoonful of the above-mentioned solution was given two or three times a day. The most marked objective phenomenon after its exhibition was a reddening of the previously cyanosed or livid tint of the lips and face. In a case of emphysema where the patient was blessed with a nose the seat of acne hypertrophica, the ordinary violet-blue colour of the organ became fiery red, and excited the surprise of the other patients in the ward. The respirations generally became deeper and less frequent, and the patients expressed themselves subjectively much relieved. The first feeling after taking the drug was one of warmth in the head; many said that they had less desire to cough, and that they found expectoration easier. Occasionally sweating occurred, and in some cases abundant salivation. No bad effects were noticed with the dose mentioned.

Dr. Penzoldt finds that the addition of quebracho solution to blood, in the presence of oxygen, makes it assume a bright red colour, and he is inclined to think that possibly the blood is rendered capable of taking up more oxygen than usual, and carrying it to the tissues. This is, however, merely a provisional hypothesis, and at present there is no satisfactory explanation of the fact that, while moderate doses of the extract alleviate dyspnoea in man, large doses cause dyspnoea in the lower animals.

As yet, quebracho bark is not a commercial product, but the wood is imported in large quantities for tanning purposes. The action of an extract of the wood is similar to that of the bark, but weaker. The alkaloid aspidodermin affects the frog, on the whole, just as the extract of the bark does.—*Med. Times and Gazette*, July 12, 1879.

Inhalation of Eucalyptus Oil.

Dr. MOSLER, of Griefswald (*Berliner Klin. Wochenschrift*, No. 21) strongly recommends oil of the leaves of eucalyptus, administered by inhalation, as a remedy for pharyngeal diphtheria. The strongest dose which he has given was according to the following formula: oil of eucalyptus leaves, 5 grammes; rectified spirit, 75 grammes; distilled water, 170 grammes; to be shaken together and used for ten inhalations. In this dose the medicine was inhaled four times daily, for ten or fifteen minutes each time, by a patient suffering from bronchitis and chronic laryngitis; it produced no troublesome effect, but acted as a powerful expectorant. Another formula employed by him was: oil of eucalyptus leaves, 2 grammes; rectified spirit, 20 grammes; distilled water, 180 grammes; for ten inhalations. This was given with the best effect in a case of croupous pneumonia in the stage of defervescence, with residual infiltration of the right upper and middle lobes. It was inhaled four times, without any bad effect. A still weaker preparation (1.5 of eucalyptus oil, 15 of spirit of wine, and 200 of water) has been used by him in several cases of nasal and pharyngeal catarrh, and also in a case of acute pharyngitis accompanied by slight laryngitis, with good effect. Dr.

Mosler is engaged in further researches on the action of inhalation of euealyptus oil in affections of the respiratory organs.—*British Medical Journal*, June 21, 1879.

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Mode of Action of Iron in Chloro-Anæmia.

Dr. HAYEM, in a communication to the Société de Biologie (*Rér. Méd.*, June 14), stated the results of the examinations made on a great number of patients in his service at the St. Antoine, in order to ascertain the modifications whieh the blood undergoes under the influence of the treatment by ferruginous substances. He chose chloro-anæmia as a type of chronic anaemia, this being of such frequent occurrence among the Paris workwomen that it is constantly under treatment in the hospitals. The first effect of the administration of reduced iron, or of an assimilable salt of iron, to a chloro-anæmic woman is to cause the disappearance of the alterations in the globules which constitute the anatomical lesion in anæmia. This action is always sensibly manifested, whatever may be the number of globules. In some cases of slight anæmia the number of globules is not diminished, they simply undergoing change in form; but in other more serious cases both diminution in number and alteration in form take place. In these the iron acts first by restoring the existing globules to their physiological condition, and then by facilitating the genesis of other globules. Some physiologists have maintained that the iron does not become fixed in the blood, its passage through the economy sufficing for the good effects which result from its employment. In order to appreciate the value of this opinion, Dr. Hayem, in conjunction with Prof. Regnault, undertook some experiments on the mode of action of the ferro-cyanide of potassium, which is eliminated unchanged. Several anæmic patients were submitted to its treatment for some weeks, and an amelioration was obtained from its use, as sensible as if an assimilable salt of iron had been administered. But no sooner was it discontinued than the symptoms of anæmia returned with great rapidity; and, in order that the cure should remain definite, it was necessary that the ordinary ferruginous preparations should be given after the ferro-cyanide. Everybody knows how difficult it is sometimes to get some much enfeebled chlorotic patients to take reparatory aliments, so great is their disgust for all azotized aliment, vomiting often ensuing when they attempt to eat meat. Some women live upon a little bread and salad, and the quantity of urea they eliminate is then very small—sometimes as little as from four to six grammes in the twenty-four hours. In such women treatment becomes very difficult, it being nearly impossible to reproduce appetite in them. In these cases Dr. Hayem employs a means which has furnished most excellent results, and which consists in the daily inhalation of oxygen. The appetite soon returns, the vomiting disappearing at the same time; and so well do the patients then support azotized aliments, that the four regular "portions" of the hospital diet-scale becomes insufficient. When the urine is examined, the proportion of urea is found to have considerably increased; so that after continuing the inhalations for six weeks, the amount excreted may reach as high as thirty grammes in the twenty-four hours. The number of globules is at the same time increased, but they remain altered in form, showing that the disease is not cured. And, in fact, if after two months' residence in the hospital such patients are allowed to go out without anything more having been done for them, at the end of a week they fall into as complete a state of anæmia as if they had never undergone any treatment. But if, after the oxygen inhalations, a ferruginous treatment be put into force, the cure remains real and definite. It results, therefore, from Dr. Hayem's experiments, that in order to put patients into a state for the production of physiological globules, iron must be given them.—*Med. Times and Gazette*, July 5, 1879.

MEDICINE.

Treatment of Acute Rheumatism by Salicin and Salicylic Acid.

In an interesting paper on this subject (*Lancet*, June 21, 1879) Dr. T. J. MACLAGAN maintains that salicin and salicylic acid are not anti-pyretic to any useful extent. He holds that they are anti-rheumatic, and their beneficial action in acute rheumatism is due, not to their allaying the fever, but to their putting a stop to the whole process of the disease, and to all that constitutes it—the fever as well as the other symptoms. As a rule, relief of pain precedes fall of temperature.

In the last three years Dr. Maelagan has used the two remedies in about equal proportions. The result has been to convince him that salicin is the better remedy of the two. His preference is based on the fact that he found the action of salicin to be tonic, while that of salicylic acid is depressing, sometimes alarmingly so. This difference, be it noted (and the point is an important one), is quite compatible with their exercising an identical action on the rheumatic poison, and evidence all tends to show that their action in this respect is the same. To get the full beneficial effects of either remedy it is necessary to give it in large and frequently repeated doses—twenty to thirty grains, at first every hour, and then every two, three, or four hours, as the symptoms decline. Salicylic acid and salicylate of soda cannot be given in such doses without some risk. Salicin may thus be given without fear.

To get the full beneficial effects of either salicin or salicylic acid in acute rheumatism, large doses are necessary. By smaller doses, he says, ten or fifteen grains every hour or every two hours—an attack of acute rheumatism may be arrested in two or three days. But let the remedy be given in the larger dose, and the process of the disease may be arrested in half the time. In a malady which tends to involve the heart and entail on the patient the terrible results of an endocarditis, every hour is of consequence. Cut the malady short in one day, and you may ward off cardiac complications which may appear if it lasts for two or three. It takes about an ounce of salicin or of salicylic acid to cure a case of acute rheumatism. The sooner this quantity is got into, or rather is passed through, the system the better. Dr. M.'s practice now is to give thirty grains every hour. By the time that an ounce has been thus taken—that is, in sixteen hours—the patient is generally free from pain, and the temperature at or near the normal. He then gives thirty grains every two or three hours till another ounce is consumed. After that thirty grains are given three times a day for a week or ten days, to guard against the possibility of relapse. Not unfrequently the patient feels better after three or four powders have been taken, and is practically out of the attack before the ounce is consumed. In such cases the interval between the doses may be widened after six or eight have been taken. Such is the course of events in favourable cases, and almost invariably their course in young subjects who have not previously suffered, or have done so only once or twice. In older subjects, who have had frequent and long-continued attacks, the acute symptoms may be as speedily allayed, but convalescence is more tardy and more apt to be interrupted. Cases treated by salicin seem to convalesce and pick up more quickly than those treated by salicylic acid or salicylate of soda.

Dr. Maelagan finds that salicin is also of value in the treatment of chronic rheumatism and neuralgia.

The Influence of Treatment on the Course of Rheumatic Fever before and since the employment of Salicylic Acid.

Dr. WILLIAM SQUIRE read a paper on this subject at a late meeting of the British Medical Association (*British Medical Journal*, Aug. 23, 1879). He said: A concurrence of three conditions is found in all cases of acute rheumatism: 1. Increased waste; 2. Checked elimination; 3. Ready febrile reaction. Of these, the last is the most important; even a certain specificity in this reaction is requisite to determine that the resulting disease shall be rheumatic fever and not tuberculosis, erysipelas, or pneumonia. To these three conditions treatment has always been directed. Complete rest is the first necessity. Rest diminishes waste, prevents pain, induces sleep, and so directly tends to lower fever; the balance of elimination, aided by diluents, is restored; and the patient placed in a fair way of recovery. It has been said that, where early treatment with every comfort can be secured, much of the danger of heart-mischief is avoided; but the tendency to heart-complication during attacks at the same ages is much the same for rich and for poor; what care and comfort can do, is to guard against the incidence of attacks during early childhood, when danger to the heart is most to be dreaded. No method of treatment has any specific power in preventing disturbance of the heart during the illness, or in precluding the relapses in which such disturbance may again arise. Whatever lowers the fever and shortens its duration, tends to avert heart-disease. While Dr. Squire was studying the progress of acute rheumatism in the clinique of La Charité in Paris, some cases were being treated with full doses of quinine, and others with repeated small bleedings. In these, relief was felt after the abstraction of a *demi-pallette*, and, among other signs, the moist skin seemed to show in these patients that the fever was reduced; in those under quinine, from the headache and dry skin, the fever was said to remain unabated. The clinical thermometer completely reversed this impression: it showed the fever to be uninfluenced by the bleeding, and that a considerable reduction of temperature had been effected by the quinine. In many of these latter cases, convalescence was early; it was tedious and interrupted in the others. Quinine, in checking waste, unexpectedly lowered fever. Bleeding, expected to reduce fever by increasing elimination, failed in this object; as all evacuants fail—whether purgation, diuresis, or diaphoresis—when carried beyond the restoration or re-establishment of normal secretions to the elimination of morbid products or a supposed morbid poison. Another object aimed at by this treatment was, to counteract one of the primary products of the disease—an increase of fibrin in the blood, to which some of the evil consequences may be attributable. No doubt, potash and the nitrate of potash may be directed to this end with greater safety than bleeding or calomel can be; but the alkaline treatment, as well as the bleeding, tends to increase the subsequent anaemia which so much retards convalescence. Moreover, the increase of fibrin, the state of hyperinosis, is a direct consequence of the febrile state. This is diminished by whatever controls fever, while it is actually increased by some of the eliminative means employed, as by sweating under blankets; it is relieved by tepid sponging. All soothing means are antipyretic—ease of joints, sleep at night—whatever relieves pain reduces fever. Colchicum relieves the local pain of gout, and the fever falls. The general anaesthesia induced by salicylate of soda has much to do with the antipyretic influence it exerts in rheumatic fever. This sedative effect, with lowered vaso-motor reaction, permits a readier return to the normal excretion of urea, thus promoting and hastening the natural crisis, or rather lysis, in which the disease should end. With the increase in the amount of urea and uric acid excreted, the joints become less painful, and this in many

cases somewhat precedes the fall in temperature; hence the fever has been regarded as dependent on the articular mischief, and treatment by blisters has been directed specially to the affected joints, not without some degree of success. As much may be said for the eliminative treatment intended to promote the removal of the products of tissue-waste; neither plan will lower the first fever or lessen the danger of heart-disease, nor diminish the anaemia of convalescence with its tendency to relapse. Before the use of salicylic acid, we had no means of controlling the fever of rheumatism on which these evils depend. The power of quinine had found a limit; purgatives and salines proved useless. Aconite, digitalis, and veratrum had failed. Cold was reduced by Wilson Fox to its true service against hyperpyrexia, and bleeding proved to be as injurious in this complication as it is in the ordinary course of the disease. The iron-treatment introduced by Dr. Russell Reynolds checked in some degree the febrile reaction, prevented subsequent impoverishment of the blood, and some of the worst consequences of endocardial exudation. Its use in erysipelas, and in rheumatism following some specific fevers and the puerperal state, is well attested. With children, cases may arise where a choice has to be made between iron and salicylic acid; one or the other must be adopted; they cannot both be employed at once. Dr. Squire's experience of iron was a favourable one. Twice in children where the first signs of rheumatism were in the heart, this means, with chloral at night, gave good results. In one case of a boy five years old, treated early with salicylate of soda, no heart-affection occurred. In a girl three years old with an endocardial murmur, and no joint affected when first seen, good progress followed the salicylate, but a soft systolic or presystolic *bruit* remained. The only evidence of the earliest attack of acute rheumatism in young children is often in the heart. Second attacks of acute rheumatism in adolescents have been treated very advantageously by either means. The change from profuse perspiration and great restlessness to comparative comfort by the use of dialyzed iron in a young man with high fever, on the fourth day of other treatment, was very marked; good convalescence began in a fortnight. In a similar case treated on the third day with salicylate of soda, in twenty-four hours, before two drachms had been taken, all fever was subdued, and the convalescence began in a week. In second attacks, much prolonged, occurring to men at the age of fifty, one had pneumonia, one a systolic and cardiac murmur and diffused pulmonary *râles*; rapid improvement followed the use of salicylate of soda. Cardiac irritation is always soothed under its influence; with a steadier circulation the *râles* in this case disappeared, diarrhoea, meteorismus, and perspiration ceased, and the urine, pale and of low specific gravity, as it often is in these prolonged cases, was soon restored to its normal quality. What none of the eliminative means used had been able to effect now occurred. An increase in the elimination of urea, noticed in favourable cases, is aided by the salicylate of soda; it acts as a sedative without checking any of the secretions. The relief of pain is partly from its action on the central nervous system, more directly from the dilatation of the peripheral bloodvessels which it produces; at the same time excitability of the heart is lowered, hence its utility when the heart is already involved, while by its power to arrest the special febrile action, at whatever period of the disease it is given, no remedy can be so likely to prevent that complication. The earlier it is given and the sooner its effects are produced, the less likely is the heart to suffer, for the shorter the duration of the fever the less is the possibility of heart-disease. As salicylic acid is rapidly eliminated by the kidneys, the doses of it, or of salicylate of soda, must be frequently repeated. Salicine is but slowly and partially converted into salicylic acid. The acid is less easily and less safely administered than salicylate of soda, and is in no way more efficacious where no

germicide influence is required. The acid so readily and cheaply obtained from carbolic acid, since Kolbe's great discovery, has exactly the therapeutic properties of that prepared by Cahors from the wintergreen (*Pyrola*) as determined in 1855 by Bertagnini. Salicine, as first separated by Leroux from willow-bark, has been found by Senator and others to have no other action. The salicylate of soda is the readiest way of giving the remedy where its effects should be produced rapidly, a point of great importance in the young, and is exactly suited to what is required in the treatment of acute rheumatism.

Dr. ANDREW CLARK summed up the results of the discussion which the paper elicited, as follows: First, they had as yet no stable criterion whereby to determine the therapeutic effects of any drug upon rheumatic fever; they did not yet completely know the history of this fever. Secondly, therapeutic conclusions were apt to be vitiated by failing to distinguish between the two forms of the disease,—the continued and the relapsing form. Third, while the influence of salicylic acid and its compounds somewhat speedily relieved the *malaise* of which the rheumatic sufferer complained, it was extremely doubtful whether they in any degree diminished the peril of secondary cardiac or other inflammatory complications. Lastly, it was left uncertain whether they succeeded in removing that actual pathological state of which, in a sense, these other things might be said to be the expression. In short, there was almost a greater tendency to relapse with the salicylates than otherwise. Although this did not seem to be a very great gain, yet it was enough to help them in future inquiries.

Recent Observations on Mumps.

Mumps was known at a very early period of medical knowledge. Hippocrates left us a very faithful and minute description of the disease. But a great diversity of opinion as to its nature and etiology has always prevailed among medical authors. Some, and among these several leading practitioners, consider the affection to be local, brought on by taking cold; while others are of the opinion that it is the local indication of some general affection whose places of predilection are the glands, such as the parotids and testicles in man, and the parotids, breasts, and sometimes the ovaries, in woman. Those who consider mumps as a local affection differ in their opinion as to whether the disease is caused by acute inflammation of the parotid gland or by retention of the saliva caused by some obstruction of Steno's duct. The principal questions which remain to be elucidated on the subject are the following. Is it a local or general affection? Is it either a miasmatic or a contagious disease, or both miasmatic and contagious at the same time? Ought it to come under the head of fevers which accompany eruptions, or is it a disease which belongs to an entirely new group?

Further light has been thrown on several of these questions, especially as far as infection is concerned, by an able thesis by Dr. PINET of Paris, discussed in the *Journal des Connaissances Méd.*, January, 1879. The author, an army surgeon, has had ample opportunity of studying the disease closely in French barracks (where it seems to occur epidemically), and of tracing it to its origin. After giving a historical sketch of the labours of his predecessors on the subject, Dr. Pinet very carefully enumerates and analyzes a number of cases, and draws from them the following conclusions.

1. The affection must be considered as being general, not local; because, in certain cases, general symptoms have preceded the local ones, which manifested themselves in the form of affections of the parotids, testicles, prostatic gland, urethra, intestines, eyes, brain, etc. 2. It has never been known to occur twice in the same individual. 3. It occurs epidemically. 4. It is contagious.

As far as the etiology of the disease is concerned, the author ascribes it to

miasmatic and contagious causes, which both infect the whole organism ; but he does not exclude the possibility of infection caused by the medium of outward circumstances and surroundings or individual predisposition. He traces back to these influences the first impression caused by the zymotic germs on certain organisms, where they find a fertile soil that is ready to receive them ; as well as to their predilection for certain organs. It is well known that inflammation of certain glands may either exist alone or follow in the rear of some other similar inflammation. The prevailing idea as to this affection is that, although painful, it is harmless ; but the disease is known to have given rise to serious complications, among them atrophy of the testicles, which seems to occur much more frequently than has been suspected. It either affects only one testicle or spreads to both, reducing them to the size of a nut or almond. Another and not less dangerous complication is disease of the kidneys, which manifests itself as albuminuria, uremia, and œdema of the skin and extremities, and generally appears when the swellings of the glands have begun to decrease. In some cases the patients have died of uremia ; in others, a milk diet, combined with the internal administration of perchloride of iron, has proved successful.

The symptoms of mumps are not always clearly defined, so that often a doubtful case can only be diagnosed from the outbreak of an epidemic. Several such cases have been described by Dr. PENZOLDT in the *Deutsche Medicinische Wochenschrift*, August 19th, 1878, of which we give here a short sketch.

CASE I.—The patient, a boy aged 8, had complained of feeling hot and uncomfortable, and of pain during deglutition. The temperature was 104.6 deg. Fahr. ; but no distinct changes could be traced either in the fauces or on the body, except a moderate swelling of the submaxillary glands and their surroundings. The next day the temperature had risen to 105. The left submaxillary gland was of the size of a pigeon's egg ; the swelling had spread to the lower border of the left lower jaw. The right submaxillary gland was of the size of a nut, and the tonsils were red and swollen. The author suspected that there might be some complication with parotitis, but could find nothing except a small swelling on the left ear. During the two following days, the swelling gradually diminished, and the temperature fell till it reached its normal height. It is to be noticed that in this case the characteristic swelling of the parotid gland was absent, and that the lower part of the face rather presented the peculiar features of acute swelling of the tonsils, or tumours of the lymphatic glands. The author, however, was of opinion that the case was one of epidemic parotitis, which had probably originated from infection. There was then no trace of any epidemic of mumps ; but nine days later several cases of acute parotitis occurred.

CASE II.—A boy aged 2 had felt unwell for a whole week ; but no distinct symptoms could be found, except a swelling of the left submaxillary gland and a gland behind the ear. The temperature was 106.6 deg. Fahr. The swelling spread to the right submaxillary gland, and the patient recovered on the third day.

In a third case, there were fever and vomiting, but no characteristic swelling of the parotid glands. As, however, a few days later mumps broke out among the other children of the same family, this case may be considered as belonging to the prevailing epidemic.

These few cases tend to show how difficult it sometimes is to diagnose this affection. In such a dilemma, the possibility of an epidemic of mumps, of which similar cases seem to be in some respects the forerunners, ought always to be present in the physician's mind. He will be likely to find his suppositions verified after a certain time. The duration of incubation varies from nine to fourteen days. It is to be regretted that neither of the authors has made any observa-

tions on the treatment of the disease. Dr. Pinet specially might, with his experience, have given many a valuable hint also as far as regards the prophylactic treatment.

Jaborandi, according to Dr. TESTA (*Il Morgagni*, July, 1878), is a most powerful and efficient remedy. Its efficiency may be explained by its hydragogue and sialagogue properties; and if given in time it may prevent the affection from breaking out.—*British Med. Journal*, Aug. 23, 1879.

Study of Epidemic Cerebro-Spinal Meningitis.

Dr. FREY arrives (*Wien. Med. Presse*, No. 22, 1879) at the following conclusions respecting the epidemic occurrence of cerebro-spinal meningitis. The outbreak of the affection is never accompanied by a prodromal stage. Children seem to be more liable to contract it than adults. It occurs both in plains and valleys and in mountainous countries. The disease begins with a severe chill, or a violent headache, the cervical muscles are contracted, the patient becomes delirious, has hallucinations, eclamptic fits, and opisthotonus. All these symptoms may appear at the onset of the illness, and continue for two or three days, if the patient has not succumbed in the course of the first few hours. At the end of the second or third day a remission occurs, the contractions of the cervical muscles and the headache cease, and the patient recovers consciousness gradually. This state lasts only for a few hours, when the former condition again sets in. In the course of the affection, remissions occur frequently, though they never assume a typical character. As far as the febrile movements are concerned they are entirely independent of the severity of the affection. Thus, in some cases the patient has been in a most dangerous condition, and yet the temperature has only been slightly raised. Other symptoms are: injection of the bloodvessels, of the conjunctiva, strabismus, oedema, hyperaesthesia of the skin, and consequently great restlessness. The thoracic and abdominal viscera are perfectly normal. In one case only the spleen has been found to be enlarged. The functions of the bowels are temporarily disturbed; no albumen in the urine. In two cases out of nine the author has observed skin eruptions—herpes in the corners of the mouth, and on the cheek, like the eruption in intermittent fever and pneumonia. In almost all cases there were hallucinations of hearing, and visual disturbances, photophobia, strabismus, diplopia, and amaurosis. The affection does not always terminate in death: in some cases the patients die within a few hours, in others they recover in the course of two or three weeks. Some die on the eighth day or sooner, while others are unable to leave their bed for eight to nine weeks or more, during which time they are both blind and deaf. These are the most hopeless cases, as far as the mental powers of the patients are concerned, for they are often subject to hallucinations, while at the same time their bodily weight increases, and there are no febrile symptoms. The question whether cerebro-spinal meningitis is contagious or not, has not yet been satisfactorily answered. In some cases, several individuals have been taken ill in the same house, while in others the patients were surrounded by a numerous family all through their illness, and yet no other case occurred. The treatment consisted in cold applications to the head and neck, large doses of quinine and salicylic acid; but neither of these remedies gave very satisfactory results. In cases of great restlessness morphia injections afforded some relief. Cold packs seemed to lessen the extreme irritability of the skin. Acting upon the idea that perhaps better results could be achieved by promoting the absorption of the exudation, the author prescribed ointment of iodine and mercury to be rubbed into the neck, and gave large doses of iodide of potassium, but there are no records of the effect in this treatment.—*London Med. Record*, Aug. 15, 1879.

Tubercular Meningitis in Childhood.

HENOCH considers (*Centralblatt Zeit f. Kindert*, May 1) that the only practical division of this disease into stages is that which gives a period of excitement and a period of paralytic symptoms. The duration of the disease is very variable, often scarcely eight days, and often as long as three weeks. A prodromal stage of a week or a month is not always recognized. Vomiting is one of the earliest and surest symptoms. It is repeated often in the earlier days of the disease, but later it disappears or occurs only in isolated attacks. The condition of the pulse is very variable. In nearly every case it is for a time slow and irregular, the irregularity being a symptom of great importance. Constipation is not a very reliable symptom. The author refers to cases which began with vomiting and diarrhoea, and were taken for choleric. The diarrhoea, however, stopped soon, while the vomiting persisted. The respiration is not much altered. The deep sighing inspiration, which is so important and certain a symptom, was noticed first in the cases observed at the onset of the second period of the disease. In the last twenty-four to forty-eight hours the Cheyne-Stokes breathing was almost constantly present. The accumulation of carbonic acid in the blood, in consequence of deficient respiration, and especially anaemia of the brain, are the causes of the final epileptiform convulsions. Henoch insists that tubercular meningitis must not be considered synonymous with basilar meningitis, as the purulent exudation and tubercles are not seldom seen on the convexity. Meningitis may even run its course without formation of tubercle on the pia mater, and if it succeeds to general miliary tuberculosis, will get the name of tubercular meningitis. The conspicuous symptoms are due to the inflammatory irritation of the pia mater, not to the formation of tubercle. General acute miliary tuberculosis may call forth cerebral symptoms, without participation of the pia mater; but these symptoms are very different from those of tubercular meningitis. In the former case the fever is continuously high, and the regularity of the temperature curve may give rise to a confusion of it with that of "typhus" (? enteric), or the curve is irregular, and then shows decided remissions and exacerbations. Limitation of the eruption of tubercle to the pia mater, or the brain-substance, to the exclusion of other organs, is very rare, and, when it is reported, gives rise to suspicion that the examination has not been thoroughly made. Tubercles are generally found in the spinal cord, and caseation of the bronchial glands or other organs is almost always seen. Out of eighteen cases only once was the latter appearance not present. In about half the cases tubercle or caseation was found in the lungs, pleura, liver, or spleen. Tubercle of the choroid is by no means constant.—*Lond. Med. Record*, Aug. 15, 1879.

Hysterical Hemianæsthesia in a Man.

At a recent meeting of the Society of Biology of Paris, Professor BALL showed a patient suffering from this curious affection, common enough in women but extremely rare in men. The case was one, Dr. Ball observed, of those evanescent facts which must be seized as they pass in order that they may not be lost to science. The patient was a young man twenty-six years of age, who had suffered since infancy from convergent strabismus. Some years ago, he was taken suddenly one morning with cyanosis of the ends of the fingers; his nails fell off, and ulceration occurred at the end of the fingers. The cicatrices of these old ulcerations could still be seen. Two years ago, the patient suffered from temporary loss of vision, occurring without any known cause. The malady of which he was now the subject began only five days ago. He had a violent altercation with his mother-in-law; at the close of it he suddenly became deaf and dumb. The loss

of speech lasted only twenty-four hours, the power of speech returning suddenly on the following day. But he remained deaf—at least in the left ear. Moreover, he was completely insensible on the whole of the left side of the body. He did not feel pinching on the left side, nor in the front, nor on the tongue, nor on the face. The whole of the right side, on the contrary, was the seat of extreme sensitiveness. The point of the tongue deviated slightly to the right. In a word, as regarded the phenomena of sensation, this man's body was divided into two halves by a definite line, as is seen in certain hysterical women. Neither vision nor smell was disturbed on the left side. The left eye distinguished colours as well as the right eye, and the left nostril received odours as well as the right. M. Ball concluded that the lesion was not organic but functional. He did not venture to adopt the word hysterical hemianæsthesia, which seemed to him too vague, as he believed these troubles of sensation to be the result of a nervous ischaemia. Such was not, however, the opinion of M. Magnan, who held that the characteristics of the affection were in truth those of hysterical hemianæsthesia. Metallotherapy was employed twice on this singular patient, a piece of gold being applied to his tongue for ten minutes; but no change was produced in the state of the general sensation.—*British Med. Journal*, June 21, 1879.

Undescribed Cause of Reflex Vertigo.

The following case is given by Dr. ERLENMEYER, in Nos. 44 and 45 of the *Deutsche Medicinische Wochenschrift* for 1878. The patient, a man aged 31, was suffering from stricture of the urethra, owing to gonorrhœa. For some years past, he had been subject to peculiar disturbances, which came on in the form of paroxysms. First, the left arm became stiff and heavy; then the left foot and the right arm (the right leg always remained free), the patient feeling as if his limbs were filled with lead. He never lost consciousness, but felt giddy, and had a strong tendency to fall to the left. This sensation of giddiness was also experienced whenever the patient would attempt to micturate, the limbs remaining free at such times. He complained of a continuous feeling of pressure on the forehead; had a gastric catarrh; the tendon reflex was much increased. Nothing abnormal could be detected in either his eyes or ears. Thinking that his central nervous system might be affected, he was first treated with nitrate of silver taken by the mouth, and enemata, and daily rubbed with cold water. Seeing that he derived no benefit from this treatment, the author next resorted to dilating the stricture of the urethra by means of bougies; and this time he succeeded in curing the patient. He describes this vertigo as *vertigo ab urethrâ lœsâ*, but does not offer any explanation concerning the feeling of stiffness in the extremities.—*British Med. Journal*, June 14, 1879.

Chorea, a Functional Disorder.

At the recent meeting of the British Medical Association (*British Med. Journal*, Aug. 23, 1879) Dr. OCTAVIUS STURGES read a paper which was designed to show, from an examination of the ordinary phenomena of chorea, that the affection in its simple and uncomplicated form is not due to any lesion which is demonstrable anatomically; and that its symptoms are not otherwise to be explained than by reference to the general character of disturbed muscular movement, when the source of such disturbance is, directly or indirectly, a mental impression. This position it was sought to maintain by reference to (1) the age and sex of the patients; (2) the actual character and common associations of the affection; and (3) the modifications it undergoes at the various periods of life. The period of greatest motor activity is also the period when chorea is most frequent; the affec-

tion occurs to girls much more often than to boys; and as a general disturbance in young children, but as a local disturbance in those that are older. The limbs which chorea chiefly affects are the same which are chiefly concerned in intellectual uses, and which are on that account the most likely to suffer disturbance under mental excitement or over-strain. The frequent concern of the hands in the chorea of school-children, and the almost invariable participation of the face in the elder and self-conscious patients, were quoted among the facts admitting no other explanation. A similar transmutation of mental into motor disorder is to be met with, for example, in the hysterie fit, from emotion being exchanged at the height of the fit for pure spasm; also in children, who, in the most active bodily exercise, are the nearest to emotion, and whose emotion is readily dispelled by bodily movement. In chorea, there is in fact a most intimate alliance of mental and bodily disorder, and this alliance becomes more and more conspicuous as life goes on—the chorea of childhood gradually blending with emotion as womanhood is approached. Chorea, unlike the over-movement of emotion, does not disappear when its cause is removed. This was explained by considering that the purposive movements are as yet defective and half learnt, and in need of care and direct attention. A disturbance of the kind supposed throws the child back to its early and untrained condition, and especially as regards the higher movements. At the same time, the efforts of the child to maintain stillness, and the extra observation it receives, contribute still further to the choreic restlessness. The common course and progress of chorea at various ages were next discussed; its tediousness, but almost certain recovery, in childhood; its severity at the time of puberty; and the fact that, when seen in its then modified form, in adult life, it is commonly an incurable affection, were referred to as indicating the analogy between chorea and all other motor disorders of a functional kind; the child finding the cure for its over-movement in the gradual strengthening of a control which comes with its development; the growing girl, at the time of puberty, having her disorder for the while increased by the mental exaltation of the time; while the adult, in the rare event of his reaching maturity without finding alleviation, has no reserve of hope in the future, like the others, but keeps his disorder for life. An apparent exception to this rule was quoted as being, in fact, an illustration of it. The adults who recover from chorea are pregnant women, and these becoming liable to the affection, owing to the nervous instability of the gestation period, retain it only so long as this condition lasts. Other points were enumerated, exhibiting chorea in the light of a functional disorder; such as the occasionally contagious character of the affection; the connection between the particular cause of the chorea and the limb which is made choreic; the changeful character of the disorder, whenever the patient is openly observed, or bidden to increase or to control particular movements; the fact that the choreic body will sometimes, though rarely, suddenly right itself, and the affection all at once disappear; the frequent recurrence of chorea to the same child in the same form, with no permanent damage, no actual illness; the almost certainty of ultimate recovery; and, from first to last, not one of the symptoms which we are in the habit of calling cerebral. In conclusion, the common objections to the functional view of chorea were alluded to. The author denied the asserted intimacy of connection between chorea and rheumatism. He admitted, however, that a severe form of chronic spasm (originally described by Addison), at first resembling chorea, but accompanied by delirium and pyrexia, and often rapidly fatal, has its direct origin in acute rheumatism. The connection is here (presumably in some cases and demonstrably in others) by way of embolism. This affection, however, is extremely rare; it occurs to young persons rather than to little children, and only at the beginning does it resemble chorea. A further objection to the functional

view is that founded upon the evidence of those comparatively rare cases where chorea occurs along with other affections plainly indicative of cerebral lesion. The *post-mortem* appearances found in such cases are, however, not to be attributed to the chorea so much as to the whole group of clinical phenomena taken together. Chorea is most often seen by itself, and, so occurring, no anatomical lesion can be ascribed to it. At the same time, pathological accidents, such as embolism or thrombosis, may, in predisposed persons, cause the early appearance of choreic movement. The author alluded to other exceptional cases; those, for example, when chorea spreads from the arm to the corresponding leg; or where one-sided chorea becomes one-sided spasm or hemiplegia; or where a lingering chorea, gradually increasing in violence as the child's health fails, contrary to the rule, is at last fatal from exhaustion. Such cases, he believed, compel the admission that the purely functional disorders may, in rare instances, eventually give rise to a central change, by reason of which not only does the disorder spread to other muscles dependent on the same centre, but what was at first mere muscular restlessness (or chorea) becomes converted into a real and abiding convolution. With the presumed structural change, the symptoms here come to resemble those which depend upon various "irritative lesions" of the brain. Speaking, lastly, of the association between fatal chorea and recent endocarditis, as offering another difficulty in the way of accepting the purely functional theory, the author admitted that this concurrence is a well-established fact of pathology. It was argued, however, that the endocarditis (whose common mode of recurrence is described) is the consequence, and not the cause, of chorea; that heart-disturbance is often absent from first to last; and that the frequency of endocarditis in fatal cases does not represent its frequency upon the whole. Chorea must be accounted for independently of endocarditis, which latter, however occasioned, is not at any period of life one of its essential factors.

Hypodermic Use of Fowler's Solution in Chorea.

Dr. PERROUD, Lecturer on Diseases of Children in the Lyons Faculty, has treated (*Rev. Méd.* July 19) cases of chorea, since 1875, by hypodermic injections of arsenic, and M. Gavin in a recent thesis gives an account of thirty-three of the cases so treated. Four or five drops of pure Fowler's solution are injected by means of a Pravaz syringe, the region chosen being that where the cellular tissue is least dense and the nervous filaments are fewest. Generally an injection is practised every second or third day. All the cases were females aged from six months to fourteen years, and among them were examples of all the forms of chorea. This method is stated to be preferable, because it avoids all gastric disturbance, and the cure is generally obtained more rapidly while the dose is very small. There is little or no local irritation induced; but in some cases intolerance of arsenic occurs, although this is rare in children. As a general rule, rapid amelioration occurs, flesh being at the same time gained, while the solid matters secreted by the kidneys diminish. In sixteen of the cases the chorea was cured after a mean duration of thirty-two days of treatment, about eighteen injections having been employed. Of thirteen others submitted to these injections, but to various other modes of treatment as well, ten recovered, a longer period, however, being required. These thirteen cases were almost all of them old or relapsed choreas, so that, contrary to the assertions of Arau, Ziemssen, and others, arsenic seems to succeed better in recent and simple than in old and inveterate cases.—*Med. Times and Gaz.*, Aug. 23, 1879.

Salicylate of Soda in Chorea.

M. DRESCII communicates to the *Bull. Générale de Thérapeutique*, 15th June, 1879, the history of a case of chorea in which the movements disappeared in the course of eight days under the administration of salicylate of soda. The case seems to have been one of the most typical kind, the child herself, aged 10, being rheumatic, and her father epileptic. The salicylate was given to the extent of 6 grammes (about 90 grains) per day. During the first day each dose caused vomiting, and at night the child was sleepless. Tolerance of the remedy was established on the second day, appetite returned, the flow of urine was increased, and the choreic movements became less violent. There was also slight disturbance of sight and hearing. On the sixth day the administration of the salicylate was stopped; on the eighth day the child was well, and there has been no relapse.—*Glasgow Med. Journal*, August, 1879.

Subcutaneous Injection of Ergot in Neuralgia.

MARINO publishes (*Gaz. Clin. di Palermo*) the results of his experiments with ergot. 1. In the douleureux local injections of ergot give better results than any other remedies, quinine included. 2. The results are equally good in hemianopia. 3. In some cases of sciatica very good results have been obtained, while in other cases no relief has been afforded to the patient. 4. Ergot should be administered in other cases of neuralgia, especially if the latter is caused by blood-poisoning or cachexia. 5. The injection itself is often painful, but abscesses do not often supervene. The pain generally ceases in half an hour, especially if a cold compress has been immediately applied to the place. The neuralgic symptoms, as a rule, disappear after one or two injections; but it is advisable to continue them for some time. 6. The dose for one injection varies from 15 centigrammes to 2 decigrammes of ergot dissolved in water or glycerine.—*London Med. Record*, July 15, 1879.

Laryngeal Phthisis: Its Origin, Course, and Termination.

Dr. MORELL MACKENZIE read a paper on this subject at the recent meeting of the British Medical Association (*British Med. Journal*, Aug. 23, 1879). He said: 1. Laryngeal phthisis is due to the presence and subsequent breaking down of tubercles in the mucous and submucous membranes. The tubercles, some very small and some as large as a millet-seed, are found imbedded in a reticular structure filled with small round lymphoid cells. This tubercular matter is sometimes deposited uniformly through the thickness of the mucous membrane, but much more commonly it is found in the most superficial layer of the mucous membrane immediately beneath the epithelium. In the deep layers of the mucous membrane, both the tubercles and the round cells are less abundant. Heinze has pointed out that there is sometimes a space between the epithelium and the subjacent tubercular deposit, containing a few round cells and many capillary vessels, but no tubercles. 2. Laryngeal phthisis is essentially a secondary phenomenon, occurring as a sequel to pulmonary phthisis. There is no evidence that any case of primary laryngeal phthisis has ever existed. 3. The disease is not due to the corrosive action of the sputa. This is shown by the following facts. *a.* In many cases of laryngeal phthisis there is little or no expectoration; *b.* The sputa in gangrene of the lung, which is probably much more corrosive, does not produce laryngeal ulceration; *c.* Lymphoid cells are sometimes found between the epithelium above and tubercle below. 4. The disease is much more common amongst males than females. Out of 500 cases examined by the author during life, 365

were males and 135 females. In a hundred necropsies, there were 73 males and 23 females. 5. The most frequently present symptom of laryngeal phthisis is impairment of the vocal function. In 500 cases, the voice was impaired 460 times. Cough was a marked symptom in 427 patients. Dysphagia occurred 151 times. 6. The naked-eye appearances of laryngeal phthisis, either during life or after death, cannot be absolutely relied upon, but pale pyriform swellings of the aryepiglottic folds and a pale turban-like thickening of the epiglottis are seldom met with except in laryngeal phthisis. More or less uniform thickening, with marked pallor, of the mucous membrane and small scattered ulcers are the characteristic features of the disease. 7. The prognosis is always unfavourable. The ordinary duration of life after the throat-symptoms have become troublesome being from twelve to eighteen months. 8. The only treatment which is of any use consists in the employment of palliative remedies. Where there is pain in swallowing, insufflation of morphia gives the greatest amount of relief.

Multilocular Pleurisy.

To distinguish whether a pleurisy is unilocular, bilocular, or multilocular, is a matter of *post-mortem* examination. Such was the proposition laid down in 1854 by Professor Wintrich, and it is still generally accepted. In a communication made recently to the Académie de Médecine of Paris, which has attracted much attention by reason of the remarkable display of eloquence with which M. JACCOUD enforced his views, that able clinical physician laid down rules based upon facts which he has observed since 1870, and which enable him, as he considers, to declare that diagnosis is possible, and that it may become an useful guide for puncture. The conservation of thoracic vibrations fulfilling certain definite conditions, and coinciding with a determinate *ensemble* of physical science, supplies, according to M. Jaccoud, the means of diagnosis. The object of his researches is to determine the conditions and the signs which specialize the generic fact of the conservation of the local vibrations. According to these observations, two perfectly distinct semeiological types must be admitted.

In the first type, on one side of a thorax presenting to the full the general sum of the ordinary signs of complete effusion, vocal vibrations are preserved along a line which extends to a variable height of the chest from the vertebral column towards the sternum in a more or less regular semicircular course. At all other points, vibration is abolished. In the conditions referred to, the existence of this vibratory zone, which is marked by its vibration from the rest of the thoracic wall which is mute, cannot indicate anything else than a band of pleural adhesion stretched by the effusion, which it divided into two cavities. As to the coincidences, they have been as follows: right displacement and depression of the heart; absolute and total dulness; no subelavian tympanism; at the level of the vibrating zone, bronchial respiration and voice-sounds; everywhere else, respiratory and vocal silence, except under the clavicle, where a distant respiratory *bruit* is heard, with confused humming of the voice.

In the second type, the vibrations are preserved, more or less weakened, in the whole extent of the dulness, except sometimes in a zone of from one to two fingers' breadth at the lower part of the thorax behind. In four cases of this type which were observed, the coincidences were remarkably uniform; absolute dulness, without elasticity; stone-dulness in all the supradiaphragmatic region; no subelavicular tympanism; in the same extent, striking bronchial *souffle* and bronchophony. This type of pleurisy is distinguished from scanty homogeneous serous effusions with the vibrations preserved. By the preservation of vocal fremitus, it is not less removed from complete unilocular effusions with absolute dulness and with generalized bronchial effusions. In fact, this complex of symp-

toms has been allied, in the observations of a second series brought forward by M. Jaccoud, with the presence of a multilocular acute pleurisy. Such has been in these cases the precision of the signs, that M. Jaccoud believes himself authorized to generalize the teachings which result from them, and to say that every case of acute pleurisy which presents in a persistent manner the whole of these signs is a multilocular pleurisy with more or less multiplied secondary partitioning.

When, by the aid of these signs, the existence of a multipartite pleurisy has been recognized, can one go further in the diagnosis, and distinguish the situation of the fundamental partitions in such manner that the knowledge may direct the thoracentesis? M. Jaccoud has been able to do so in two cases in which he had recourse to puncture, and that because on the uniformly vibrating surface of the diseased side he found one or two zones where the vibrations were manifestly stronger than at other points. These zones of maximal vibration have been his guide for thoracentesis. But, if the discovery of the fundamental partitions in such a pleurisy be possible, it is not always so. The concurrence of signs on which it is based was defective in three cases which terminated in recovery. It was impossible for M. Jaccoud to discover on the affected side a regular and limited zone of stronger vibration; so that he was unable to arrive at any notion touching the respective situation of the divisions. This was one of the motives which decided M. Jaccoud to abstain from puncturing in these three cases. He had, besides, a more serious reason for abstaining; for he had acquired proof from the other cases that multilocular pleurisies do not bear thoracentesis satisfactorily.

It may be seen, from the foregoing, that the diagnosis of the multilocular disposition of acute pleurisy is a practical question of the first importance; in fact, a special prognosis arises out of this diagnosis. Even after recovery, this pleurisy is more serious than others, by reason of the adhesions which necessarily survive it. From this diagnosis follows, moreover, a therapeutical precept, which M. Jaccoud formulates in these terms. Multilocular acute pleurisy ought not to be treated by thoracentesis; puncture is only authorized in order to relieve in emergency the vital indication resulting from really imminent suffocation.

The study of multilocular pleurisy has raised, under the pen of M. Jaccoud, a second question: that of adhesions of the diaphragm. It is known that, in the ordinary pleurisy of the left side, the displacement of the heart furnishes a formal indication for thoracentesis, as a matter of urgency beyond even the consideration of dyspnœa. In multilocular pleurisy of the same side, the reasons for puncturing without delay are no longer the same. The dislocation of the heart has no longer so decisive a significance; it may even be valueless from this point of view. Indeed, from the mere fact that the pleurisy is multipartite, there is every chance that the pericardium may be fixed by adhesions in its vicious position; and, in these conditions, puncture, practised with the object of remedying the displacement of the heart, would be without any useful effect. The simple fact, then, of a cardiac ectopia, even though extensive, does not suffice to indicate puncture. To make this a legitimate indication, the physician must be able to establish, if not with certainty, at least with a satisfactory probability, that the thoracentesis will really diminish the displacement of the heart. Judgment on this point is possible up to a certain degree. The question consists in determining whether there is or is not antero-inferior effusion; but here great difficulties present themselves, the means of diagnosis being considerably retained in the left submammillary zone by the absence of all vibrations of souffle and of bronchial *ralentissement*. M. Jaccoud believes, however, that he has arrived at this end by an indirect method. In the course of a multilocular pleurisy, as in the course

of any other pleurisy, this left submammillary region necessarily presents in its depths one of the three following conditions. It is diseased, without effusion; it is healthy; or it is changed by the presence of an effusion, by adhesions of the lung, of the pericardium, of the diaphragm, and the ribs. In these cases, the negative phenomena arising from the absence of vibration, from respiratory and vocal silence, are the same; but, if the region be intact in its depths, there is not ordinarily any displacement of the heart. The respiratory movement of the epigastrum and of the hypochondrium has its physiological regularity, and percussion shows that the acute tympanism due to the presence of the stomach and the colon has its normal qualities and extent; that is to say, it reveals the perfect conservation of the tympanic space, known in semeiology as the semilunar space. When the region is altered in its deep constitution, whether by effusion or by adhesions, there is cardiae displacement, and the inspiratory rising of the epigastrum and the ribs has no longer its regular rhythm.

This observation made, it remains to distinguish from each other the two kinds of alterations. The differential signs are furnished by percussion and by the examination of the respiratory mobility of the region. Percussion is insufficient to distinguish with certainty a submammillary effusion from one with forced membranes and adhesions of the diaphragm to the ribs. It is indispensable, in order to determine if the modification noted be due to the presence of a fluid, or to diaphragmatic adhesions, to have recourse to a second sign, furnished by the respiratory mobility in the costo-epigastric zone. In the case of adhesions, not only can there be ascertained the reversal of the normal movements of the epigastrum and of the hypochondrium; but, further, one sees this pathognomonic fact; at each inspiration, an active depression of the inferior intercostal spaces, starting from the sixth or the seventh; with this depression coincides, to the same extent, a traction of the ribs themselves towards the median line. The expiration is signalized by the return of these parts to their regular position—that is to say, by an epigastric projection and an eccentric projection of the ribs and corresponding spaces.

The importance of these clinical facts is considerable. In the cases which have been cited, and of which M. Jaccoud brought forward several examples, thoracentesis would have been practised at the point general considered as the point of selection, and the trocar would have been plunged into the abdominal cavity. Such a misfortune happened to a hospital physician, who very loyally published it. The consequence of these cases is the obligation to study the adhesions in every case of pleurisy, as an indispensable element in diagnosis—an obligation which is the closer because these diaphragmatic adhesions are not rare. The interest of this subject is not limited to the domain of the multilocular pleurisy; every case of pleurisy may present these anatomical conditions; and the determination of the state of the diaphragm must henceforth become an integral part of the diagnosis of the disease; and, as M. Jaccoud adds, there exists no relation, either direct or inverse, between the abundance of the effusion and the existence of the adhesions, these ought to be looked for in every case, abstraction being made of all the other specialties of pleurisy. This appreciation is, in his view, a preliminary condition of absolute necessity for thoracentesis.

Finally, it results from these facts that it is not desirable to assign, even in a general manner, any place of selection as the space, according to rule, for the puncture of the chest in pleurisy; the point of puncture, guided above all by the eventuality of pulmonary and diaphragmatic adhesions, necessarily varies in different patients; and the belief in any fixed rule would constitute a danger arising afresh with each patient.—*British Med. Journal*, June 14, 1879.

Cases of Phthisis treated at High Altitudes.

Dr. C. THEODORE WILLIAMS, Physician to the Hospital for Consumption, Brompton, discusses (*Lancet*, Aug. 16, 1879) this subject. He finds that the influence of mountain climate may be described, in its general aspect, as intensely stimulating. The appetite is increased, the digestion and assimilation are improved, the respiration is quickened, and also the circulation. This last is a very decided feature. The effect on the lungs appears to be chiefly the result of the inspiration of rarefied air, combined with the exercise taken. The chest measurements sometimes show a very decided enlargement after residence at high altitudes. Sometimes it is the affected side, sometimes the opposite one, which undergoes enlargement, due either to hypertrophy of the lung or emphysema. The principal change in the physical signs noted in nearly all the cases was rapid and remarkable diminution of dulness, even in old-standing consolidations. This may result either from absorption of the consolidation or by hypertrophy and drawing over of the adjacent lung tissue, or again from localized emphysema; but of the fact of diminished dulness Dr. Williams has no doubt. The decrease in frequency of haemoptysis will, he believes, be demonstrated by important statistics about to be published by Dr. Spengler, and it has been insisted on by Dr. Hermann Weber and others. Mountain resorts are said to be contraindicated in cases of cerebral irritation.

Now what cases of phthisis are suitable for this treatment? It is difficult to select these accurately. Dr. Williams, however, says that the great points to bear in mind are—first, that the disease should be *limited*, and that no *large amount* of lung-surface should be involved; secondly, that no pyrexia, or tendency to pyrexia, should be present. During his visit to Davos last Christmas Dr. W. was surprised at the large proportion of pyrexia among the phthisical patients, which, considering the limited amount of disease (and that in an incipient form) which prevailed, is unusual, and different from the common experience in England. It seems to Dr. W. that the same influence which so powerfully stimulates the digestion, and causes the maximum of carbonic acid to be thrown off earlier than in the plains, exercises a corresponding influence on the inflammatory process, and converts what in England would be a passive congestion, with low temperature, into a well-marked pyrexial inflammation. Such is the stimulating influence of mountain air.

The patients who do best are instances of limited consolidation at one apex, or of limited cavity, or of hemorrhagic phthisis. In most of these complete arrest takes place; and what is most valuable in the mountain influence is, that it hardens people and makes them bear cold better afterwards. The cases of phthisis where mountain treatment is contraindicated are—all febrile patients, and those in whom the lungs are largely involved. These patients suffer terribly from the rarefaction of air, and also from the cold; and whereas at lower levels they appear merely as pale, weakly-nourished individuals, here they have blue extremities, livid countenances, never can keep warm, and present a picture of respiratory misery. Cases of laryngeal phthisis and of double cavities, cases with extensive fibrosus of the lung or with extensive pneumonic consolidation, all come under this category,

In conclusion, Dr. W. remarks that some of the cases narrated in his paper show clearly that, as regards patients suitable for a high altitude resort, at least two classes exist—(1) those benefited by the combination of cold and high altitude, and (2) those benefited by warmth and high altitude; and these points should be borne well in mind in the selection of climate.

The Seat of the so-called Anæmic Bruit of the Cardiac Base.

It has been CONSTANTIN PAUL's intention to prove that the seat of the anæmic or spasmodic bruit which is heard at the cardiac base is in the pulmonary artery. He has always preferred the use of the flexible to the rigid stethoscope. He reminds his readers that this bruit is a systolic one, and always to be heard on the left side of the sternum, and almost in every case in the left intercostal space near the sternum on the spot corresponding to the course of the pulmonary artery. The bruit may be soft or hard, and harsh; in the latter case, it is accompanied by a purring thrill and a loud second bruit, which corresponds with the tension of the sigmoid valves. He quotes ten cases in which he has observed this peculiar type, and points out that in every one of these cases a blowing sound could be detected in the jugular veins. In other patients we meet with a second type of the anæmic bruit. Here it extends beyond the second intercostal space, and can be detected in the three first intercostal spaces on the left side of the thorax, though it is loudest in the second space. The author groups in a third class all the cases where the bruit, though still systolic and on the left side of the sternum, is heard lower down, either in the second and third intercostal spaces, or in the third, or, lastly, in the third and fourth spaces. In a fourth series of observations, the bruit, although still situated in the pulmonary artery, can be heard as far as the apex of the heart. The author sums up his observations as follows: anæmia may cause blowing bruits in three different organs; viz., the jugular veins, the pulmonary artery, and the left ventricle. The bruit in the jugular veins is well known; the bruit in the pulmonary artery occurs very frequently; while the bruit in the left ventricle is only met with in rare cases. The anæmic bruit is heard in the second intercostal space, and is loudest at a distance of about two centimetres from the left side of the bone. It is systolic, and if at all prolonged, extends over the slight pause between the first and second sounds. Whenever the patient sits down or makes a prolonged effort, this bruit decreases; whenever he is made to walk quickly, the bruit increases.

The bruit which is most frequently met with is, as we have mentioned above, the one in the jugular veins. The bruit in the pulmonary artery is always accompanied by the jugular bruit. In cases where the mitral valve is affected, we are sure to meet with two other bruits: one of which is in the pulmonary artery, and the other in the jugular veins. When the patient begins to recover, the bruit over the bicuspid valve is the first to disappear; then the pulmonary bruit; and, lastly, the bruit in the jugular veins.

The bruits of the pulmonary artery are caused by two agents: anæmia and a spasmodic contraction of the vessels.

In the second part of his pamphlet, M. Paul gives the differential diagnosis between the anæmic bruit and the organic murmurs of the heart. The existence of a bruit in the jugular veins and of a blowing murmur in the left intercostal space, leads to infer that the patient is anæmic, and that he does not suffer from any organic lesion of the cardiac basis, or acute endocarditis, or stricture of the aorta; because, in both latter cases, the bruit would predominate on the right side. However, the author admits that it is very difficult to form a correct diagnosis in cases where two distinct noises are heard one on each side of the sternum, or where there is, besides the bruit in the jugular veins, another single murmur on the right side of the sternum.

M. Paul is of the opinion that the transitory bruits which are heard at the apex of the heart in cases of acute articular rheumatism are not always produced by endocarditis of the mitral valve, but may be owing to anæmia. He even asserts that this is always the case when murmurs can also be detected in the jugular

veins and at the cardiac base. He admits, however, that a third bruit, which is heard over the mitral valve, owing to endocarditis, may coexist with the two latter; but in this case it would be a permanent one. In other cases, the systolic murmur of the pulmonary artery may not be owing to anaemia, but to an organic lesion of the vessels. Again, in this case, the jugular murmur and the general symptoms of anaemia would help towards establishing a differential diagnosis.

Aneurisms of the aorta may also produce a blowing murmur on the left side of the sternum; but this could not easily be mistaken for an anaemic bruit, as it generally coincides with the second sound, and besides, the vascular lesion would always be recognized by the characteristic changes in the pulse.

The author concludes his paper by drawing a parallel between the extra-cardiac bruits and the anaemic murmur of the cardiac base, and shows that the latter is much more constant than the former, which vary very often, and are constantly modified by respiration.—*London Med. Record*, June 15, 1879.

Sounds and Bruits of the Heart and the Aorta, which can be heard at a certain distance from the Patient.

Professor EBSTEIN has published a summary of the few cases mentioned in medical literature in which bruits of the heart and thoracic aorta could be heard at a distance of half a metre or a metre from the patient. The author speaks first of the cases where the heart-sounds alone presented this peculiar phenomenon, then of those cases where bruits of the heart and the aorta could be heard at a considerable distance. As far as the latter are concerned, it is worthy of notice that both pericardial, as well as systolic and diastolic endocardial bruits, can be heard at any distance. Among the endocardial bruits, those which are caused by stricture of the atrium of the aorta are often heard at a distance, more especially so if they are owing to the formation of calcareous deposits on the semilunar valves. No case of disease of the bicuspid valves is recorded in literature where the bruit could be heard at some distance. The author then proceeds to give the history of a case which came under his own notice, where a very considerable stricture of the aorta was complicated with insufficiency and stricture of the mitral valve, and a systolic bruit could be heard at a distance of at least two metres. He then goes on to investigate the question whether bruits which present all the characteristic phenomena of cardiac bruits, can be heard at a distance in cases where neither the heart nor any of the great vessels are affected. He quotes two cases where this peculiarity has been observed. One is that of Professor Baum in Göttingen, who is now 78 years old and perfectly strong and healthy, and who has never presented any symptoms which might lead to suspect that he was ever troubled with disease of the heart. It appears that this gentleman during three years, from 1854 to 1857, heard distinctly a sound, resembling that of a flute, which issued from his chest, and was synchronic with the heart-beat. The sound was particularly clear and distinct at night. Dr. Spiers, of Frankfort-on-the-Main, is said to have observed the same sound in himself; it vanished after some time. Professor Baum has observed a similar phenomenon in a clergyman who was perfectly healthy. The sound could be heard day and night, but disappeared in the course of time.—*London Med. Record*, Aug. 15, 1879.

On Traumatic Ruptures of the Heart.

In considering these injuries, M. TERRILLON states (*Le Progrès Médical*, March 29th and April 5th) that fractures of the ribs, driving inwards of the sternum, and the penetration of missiles, are the ordinary causes of traumatic cardiac ruptures; three sorts of lesions may be thus produced.

1. More or less extensive rupture of the cardiac walls, with death rapidly ensuing.

2. Contusions and ecchymoses of the heart's muscle; these, at certain parts of the organ, do not seem to exert any influence on its movements.

3. An internal rupture of a valve, of the cords, pillars, or even the septa, may take place. These lesions may for a certain time leave the functions of the heart intact.

The following cases are brought forward:—

I. (Prescott Hewett)—The patient was twelve years of age, and died four hours after a fall. An examination showed an ecchymosis, and slight tear of the cardiae wall, with a rupture of some of the columnæ carneæ in the left ventricle.

II. (Todd)—A man, aged 44, was stabbed under the left nipple; a recovery took place, the patient not dying until three years afterwards. The anterior segment of the tricuspid valve was found to have been ruptured and hung loose in the ventricular cavity. The columnæ carneæ were atrophied.

III. (Deizeimens)—Man, aged 21, kicked by a horse in the chest and knocked backwards. Was able to get up, put on his hat, and walk towards the stable, but fell dead as he was going. At the *post-mortem* it was found the sternum had been fractured (although there was no trace of a blow) four and a half inches above the xiphoid cartilage, the lower fragment being depressed. The pericardium was filled with yellowish serum and coagulated blood.

At the anterior part of the right auricle, there was a muscular rupture half an inch in extent; an incomplete tear also existed at the circumference of the auriculo-ventricular orifice, and there was a third fissure in the ventricular septum.

IV. (Terrillon)—Man, aged 48, attempted suicide by firing a metal tube filled with iron ingots into his chest. When brought to the hospital, an hour and a half afterwards, the patient could hold himself erect, walk, and get into bed, in spite of difficulty of respiration. An external wound, large enough to admit the thumb's tip, existed at the anterior part of the seventh rib, on the left side of the chest. Death took place in twelve hours. It was found that a missile had traversed the left thoracic cavity obliquely, and lodged in the vertebral column. The heart was pushed to the right side under the sternum. The pericardium contained a little sanguineous serum. On the anterior surface of the left heart, near the apex, there was an extensive ecchymosis, without any solution of continuity, the bloody infiltration reaching the endocardium.

At the apex of the interior of the ventricle an adherent clot, the size of a thumb, was found, the musculi papillares and chordæ tendineæ in the ventricle being ruptured and floating. This contusion is stated by M. Terrillon to have been caused by the ribs and costal cartilages at the moment they received the shock of the projectile.

V. (Richet)—Man shot himself with a revolver. Death ensued in a few hours. The ball had pierced the pleura, and the pericardium over the apex of the heart had been injured. In the sac was found a teaspoonful of blood, and at the apex of the ventricle there existed traces of an extensive contusion.

M. Terrillon considers the mode in which these ruptures are brought about. If the injury be received during the systole of the heart, the state of contraction predisposes the rupture to take place at the point struck, probably the ventricular wall, but the shock, if of sufficient force, may also be communicated to the pillars and septa, and cause there, also, a solution of continuity. If the force be applied during the stage of diastole, the cavities of the organ are filled with blood and communicating, so that the excentric compression would produce a tear in the resisting valves or the septum; hence a rupture of these parts, with no, or at most very slight, traces of an ecchymosis of the cardiac walls.—*London Med. Record*, July 15, 1879.

Complete Occlusion of the Vena Cava Inferior with Malignant Disease of the Liver.

Dr. LITTLE reports (*Trans. Dublin Path. Soc.*, Dec. 1878) the following case which occurred in a man aged 26. The duration of his illness was only three months. The veins of the trunk were much enlarged and varieose, particularly those occupying the front and the lateral axillary line. The blood in these coursed upwards. There was no ascites at first, but it appeared later. The urine was ieteric. The inspection showed a much enlarged liver, due to many spherical masses of cancer; and the disease appears to have been a primary one of the liver. The inferior cava was quite obliterated in its passage through the liver for an inch of its course. The closure had taken place above the openings of the hepatic veins, and just before the vessel pierces the diaphragm, and in close proximity on each side were the largest cancerous tubercles. The anastomosis had been carried on in three principal systems. (1) The epigastric veins anastomosing with anterior intercostals and internal mammary. (2) The circumflex iliac veins anastomosing into the long thoracic. (3) By the enormous enlargement of the vena azygos, which was as large as the vena cava ought to have been. [Dr. Little alludes to the extreme rarity of pathological obliteration of the vena cava inferior, and states that he has only been able to discover one other case so complete as this. That may be so, but occlusion by clots and tumours is not by any means so very rare, and that they are not to be found in pathological literature must not be taken as evidence that they are rare. Like many other conditions, they are to be found recorded in the post-mortem records of hospitals, but not in any large number.]—*London Med. Record*, Aug. 15, 1879.

[The reader is referred to a case reported by Dr. Osler, of Montreal, *vide* the number of this JOURNAL for July, 1879, page 239.]

Two Cases of Perforation of the Oesophagus.

Dr. LESSER relates (*Deut. Med. Woch.*, No. 13, 1879) two cases of perforation of the oesophagus, which were treated in the Augusta Hospital in Berlin, and for which he is indebted to Professor Senator. The first case is that of a man who had for the last four months been suffering from an increasing difficulty in swallowing. He was at last obliged to subsist entirely on liquid food. When examined at the hospital, an obstruction was found in the lower portion of the oesophagus. The treatment consisted in gradually introducing thicker sounds into the oesophagus, till the obstruction had been apparently removed; the patient, on leaving the hospital, was able to take solid food without much difficulty. Three weeks later he came back, feeling much worse. He was unable to swallow liquids. The next day, on attempting to drink, he had an attack of coughing, and expectorated two clots of blackish blood; after which he felt better, and able to swallow. During the following days, the stools were black. It was noticed that the patient, when lying on his right side, had a severe attack of coughing whenever he attempted to swallow, and complained of a sensation as if the liquid had penetrated into the right side of the thorax. He had no difficulty in swallowing when lying on his left side. The sputum contained, besides pus and a few red blood-corpuscles, a great quantity of ciliated cells. It did not smell offensively. The ciliated cells were expectorated until the death of the patient. At the *post-mortem* examination, a large ulceration was found in the middle of the oesophagus, which occupied its whole circumference; its edges were thick and swollen. The portion of the oesophagus which was to the left of this ulceration adhered firmly to the right aorta, and on the right side to the right lung. In this place, there was an opening of the size of a sixpenny piece in the oesophagus,

which communicated with a large gangrenous cavern in the right inferior lobe of the lung. The cavern contained some liquid of a greenish tint, which had no fetid smell. The swelling in the oesophagus was examined microscopically, and turned out to be a caneroid. The second case presented very similar symptoms, except that the patient could not swallow liquids without having a severe attack of coughing, during which the fluid was expectorated. As he was in a state of extreme emaciation, it was impossible to examine him very thoroughly when admitted to the hospital. It was, however, supposed that there existed a communication between the oesophagus and the trachea, or a bronchus. He died suddenly, after a short stay in the hospital. At the *post-mortem* examination a large aneurism of the arch of the aorta was revealed, which had a small opening to the right. The connective tissue between the aorta, spinal column, and oesophagus, was of blackish hue, as was also the periosteum of the corresponding vertebræ. The periosteum was detached from the bone in one spot, and the bone exposed. In the corresponding portion of the oesophagus there was an opening about two centimètres long, of irregular, oblong size, the upper edge of which was formed by a fold of normal mucous membrane, while the lower edge was also of a blackish hue. Underneath this opening was a small depression in the anterior wall of the oesophagus. The anterior rim of this depression was partly covered by a fold of mucous membrane, and in its centre was a round hole of about three millimètres in diameter, which led into the left bronchus, which was situated beneath it, and adhered firmly to the oesophagus. The stomach and oesophagus contained large blood-clots; the intestines were also filled, to a great extent, with clotted blood. The depression in the oesophagus, which corresponded to the spot where the latter adhered to the left bronchus, corresponds exactly to the "traction-diverticule," which has been described by Rokitansky and Zenker. What the immediate cause of the perforation was is not clear. Perhaps it was caused by suppuration, owing to some particles of food which had penetrated into the diverticulum, and produced inflammation. The aneurism was an independent affection, probably caused by a syphilitic infection of long standing. The pressure which it exercised on the mucous membrane of the oesophagus had evidently been the cause of the ulceration which finally perforated into the aneurism, and thus led to the final bursting of the latter. We have, in this case, a primary perforation of the oesophagus, owing to the formation of a diverticulum, and a secondary perforation caused by the pressure of an aneurism.—*London Med. Record*, July 15, 1879.

Case showing peculiar Auscultatory and Percutatory Gastric Phenomena.

At a meeting of the Medical Society of Leipzig, Herr STRUMPELL (*Berl. Klin. Woch.*, No. 30, 1879) presented a patient with peculiar gastric phenomena. The patient enjoyed good health until her eleventh year, when she began to suffer occasionally from slight gastric disturbances, such as a feeling of pressure in the stomach after food, etc. About this time, the patient first began to manifest the peculiar gastric noises with which she is now troubled. A loud rolling noise is heard, loudest when the stomach is only half filled with food, which is isochronous with the respiration, consisting of two distinct parts, an inspiratory and expiratory one. When the patient holds her breath, the noise immediately ceases, and only a few isolated splashing sounds are heard by placing the ear directly over the stomach. If the stomach is empty, or the patient has been fasting for some time, the sounds can hardly be heard, but they appear again if liquid food is swallowed. If the stomach is filled with fluid food, the sounds become again weaker. They are very loud when the patient stands up or sits, and can at such times be heard all over the ward. When she lies in bed the sounds again grow weaker,

and can only be heard by putting the ear close to the stomach. If the hand is placed over the gastric region while the noise is loudest, the rolling sound is felt very distinctly; it seems as if at every inspiration air were driven from the epigastric region downwards and towards the left, and then went back again. If the stomach is percussed about a hand-breadth below the left lower edge of the thorax, a full deep tympanitic sound is obtained during inspiration, which during expiration alters into a high tympanitic tone. The stomach appears on the whole slightly dilated. The other organs are healthy. It is almost impossible to give a satisfactory explanation of these phenomena. The sounds are evidently caused by the air being squeezed, by the moving of the diaphragm, from one space into another which contains water. During expiration, the air is sucked up and drawn back into the first space. It has been suggested that the stomach may have the hour glass form, or that there may exist a partial gastric hernia.—*Lond. Med. Record*, Aug. 15, 1879.

Inflammatory Fungoid Neoplasm.

At the late meeting of the American Dermatological Society (*Med. Record*, Sept. 13, 1879) Dr. DUHRING presented a supplementary history of the remarkable case which he had shown at the preceding meeting (see number of this Journal for January last, page 259). After October, 1878, the patient continued to exhibit signs of increasing cachexia, although a striking characteristic of her case was the variability of her condition from day to day. She suffered much from the profuse suppuration of the lesions, which was accompanied by the most extreme fetor. The consolidated tumors on the forehead increased to an enormous size, and at last presented a striking resemblance to a huge roasted tomato. As it gave her so much annoyance, and she was exceedingly anxious for the operation, it was finally removed by the galvano-cautery, and although the growth was remarkably vascular, there was no hemorrhage whatever. This was true, also, of the removal, in a similar manner, of a large tumour in the popliteal region. In this respect a striking contrast was presented by the two former operations, which were described last year, and which, as they were performed with the knife, were accompanied by a large amount of hemorrhage.

The case resulted fatally early in the month of May, 1879, and at the autopsy it was found that none of the internal organs were affected with the disease except the bladder, on the walls of which there was a growth corresponding in character to those on the exterior portions of the body. After a careful study of the whole case, Dr. Duhring concluded that the affection was, in all probability, of an inflammatory nature, although some of the microscopical features of the specimens from it seemed to point towards sarcoma.

The Use of Iodide of Starch in the Treatment of Lupus Erythematodes.

In a paper read at the late meeting of the British Medical Association (*British Medical Journal*, August 23, 1879) Dr. MCCALL ANDERSON, after remarking on the obstinate way in which this affection resists internal remedies, stated how he was first induced to try the administration of the iodide of starch, it having been employed with the most happy results by Dr. Colligan, of Paisley, in a case in which all the ordinary remedies failed to make any lasting impression; and Dr. Anderson now regarded it as a valuable addition to our means of combating this most obstinate disease. The following is the formula for its preparation. Rx.—Iodi, gr. xxiv; amyli, ʒj. Triturate the iodine with a little water, gradually adding the starch and continuing the trituration till the compound assumes an uniform blue colour, so deep as to approach black. The iodide should be dried with a heat so gentle as to run no risk of driving off the iodine, and it

ought to be kept in a well-stoppered bottle. On no account should spirit be used in its preparation instead of water. The dose is a heaped-up teaspoonful in a draught of water or water-gruel thrice daily; but it may be safely increased even up to an ounce in some cases. In using it, care must be taken, first, that the cases are really undoubted cases of *lupus erythematodes* and not *lupus vulgaris*; and, second, that the medicine is freshly prepared, and in accordance with the directions above mentioned.

A Rare Nodose Condition of the Hair.

At the recent meeting of the British Medical Association Dr. WALTER G. SMITH, of Dublin, exhibited and described specimens of a remarkable affection of the hair which had lately come under his notice. A healthy girl, aged 19, applied for advice concerning partial loss of hair, which began to fall out about four years ago without any apparent cause. Previously to that time, she had always possessed a good head of hair, reaching down to her shoulders. The hair was uniformly thinned over the whole scalp, and the longest hairs measured about five inches. Upon close inspection, a singular appearance was noted. Nearly all the shorter hairs presented a regular succession of swellings along the shaft, one nodosity corresponding, on an average, to one millimetre of length of hair. The eyebrows were thin; but no beaded hairs could be detected either among them or in the eyelashes. The axillary hair was scanty, but normal; and on the pubes one hair was found with three of the characteristic fusiform swellings. The microscopical characters of the affected hairs were very remarkable, and were illustrated by drawings and specimens. There was scarcely a trace of scale-imbrication on the nodules; but it was tolerably well marked in the contracted portions. Brown pigment was deposited outside the axis in streaks, much more abundantly in the nodes; and thus each hair, viewed by the naked eye, presented the appearance of being checked alternately brown and white. There was no trace of cells in the axis of the nodules. No account of this curious condition had hitherto been published; but Dr. R. Liveing had a similar case under his charge some years, the details of which were given in the paper. Dr. Walter Smith took occasion to point out that these nodose hairs exhibited no evidence of any fungoid elements, and that they could not be confounded either with piedra or with the trichosyphilis of Wilson. From trichorexis nodosa, with which it might be supposed they had affinity, they differed in several particulars. 1. There was little tendency to partial fracture of the cuticle, or brush-like splitting of the cortex. 2. The nodose hairs occurred in multitudes on the scalp. 3. When a hair was broken, the fracture was usually clean, not fibrous, and occurred through a constriction, never through a node. 4. The nodes were opaque, and constituted the darkest parts of the hair. 5. The nodules were very numerous, and succeeded each other in regular order like beads on a necklace.

Dr. McCALL ANDERSON (Glasgow) had examined the hairs, and found they were not parasitic. Though trichorexis nodosa was rare on the head, yet he was familiar with it in that situation. He thought that this condition was closely allied to trichorexis nodosa, though not exactly the same.—*British Med. Journal*, Aug. 23, 1879.

SURGERY.

Antiseptics on the Battle-Field.

At the eighth Congress of German Surgeons, Prof. ESMARCH, of Kiel, observed (*Wiener Med. Wochenschrift*, June 7) that in 1875 he had given some

very positive directions as to the employment of antiseptics during battle, but as these had been either disputed or misunderstood, he felt desirous of again bringing them forward, with some explanations. He sets out from two maxims—one being that although the exact carrying out of the antiseptic method may be difficult, yet the surgeon should be so penetrated with its principles that he should make it his guide in any treatment adopted. The other is, that the surgeon must before all things be careful that no harm is done to the wound by unnecessary probing, the introduction of unclean instruments, the application of undisinfected dressings, etc. For the earliest aid to be given to the soldier on the battle-field, Prof. Esmarch has devised a dressing-packet which every soldier can take with him in place of the charpie hitherto used. It contains, wrapped up in parchment-paper, a triangular cloth, a piece of stiffened gauze bandage, and two antiseptic balls—these consisting of salicylated wadding surrounded by carbolized gauze. Such a dressing serves for by far the greatest number of injuries received in battle. In favour of its use it may be stated—(1) most injuries in battle are simple gunshot wounds; (2) hemorrhage, as a rule, is very slight; (3) the secretion from the wound is very small, and remains so if the wound is managed antiseptically; (4) the most severe wound remains in an antiseptic condition if an antiseptic scab is once formed over it; (5) the ordinary charpie is positively detrimental to the formation of such a scab; (6) the antiseptic balls contribute much to its formation; (7) the antiseptic balls can be sufficiently protected by wrapping them in gutta-percha paper. The antiseptic balls should be applied directly to the wound, covered with gutta-percha paper, and fixed on by means of stiffened gauze. This dressing can be kept moist by any suitable fluid the soldier may have about him, such as water, wine, or brandy. The triangular cloth may be used to keep the wounded extremity in a quiet position. In order to apply such a dressing no technical knowledge or acquaintance with the antiseptic method is required. The packet should not be kept in the soldier's pocket, but sewed into some safe part of his uniform. Prof. Esmarch has had no opportunity of trying his dressing-packets, but the trials made of them by Drs. Bergmann and Reyher during the late Russo-Turkish war have strengthened his conviction of their utility.

At the same Congress, Prof. PAUL BRÜNS, of Tübingen, gave an account of a substitute for Lister's gauze, which is very suitable for military practice. To four hundred grammes of resin that has been passed through a very fine sieve are gradually added two litres of spirit, constantly stirring for the fifteen or twenty minutes required to dissolve the resin. After this has been completely dissolved, one hundred grammes of carbolic acid and eighty of castor oil are added, stirring until thoroughly mixed. In time of peace, for the castor oil one hundred grammes of melted stearin may be substituted; but the solution will then have to be made at a temperature of 15° Réaumur. With this, from twenty-seven to thirty metres of unstiffened gauze is impregnated by the mixture being equally diffused over it in large flat vessels. The bandage material is then dried, in order that the spirit may evaporate, this taking place in five minutes in the open air in summer, and in from ten to fifteen minutes in a moderately warm locality in winter. The material so prepared will remain unchanged for months if kept in a tin box. For use in war time, a concentrated mixture may be prepared and kept in air-tight bottles, to be diluted with spirit before spreading on the gauze. The advantages of this gauze so prepared are—1. That it is a complete substitute for the Lister dressing. 2. It can always be prepared quite fresh. 3. It produces no irritation of the skin. 4. It can be prepared in half an hour. 5. Its price is only half that of Lister's gauze. Even this price can be greatly reduced by boiling the gauze that has been used, and reimpregnating it. This in

nowise interferes with its antiseptic quality; and, as the same gauze will bear ten or fifteen boilings and impregnatings, it becomes a very cheap preparation.—*Med. Times and Gazette*, Aug. 23, 1879.

Catgut as a Source of Infection.

Prof. ZWEIFEL, of Erlangen, reports (*Centralbl. f. Chir.* No. 12, 1879) a case where twelve days after closing a very small vesico-vaginal fistula with a catgut suture, the patient had pyæmia and died. The *post-mortem* examination proved that the infection could only have taken place from the pelvis. The instruments used for the operation had been kept in carbolic acid for many hours before the operation, so that the infection could only be ascribed to the catgut. Professor Zweifel was confirmed in his suspicion by reading an article in a foreign journal where a similar occurrence was related. It had been a case of ovariotomy. The operation had been performed with all possible antiseptic precautions, and the patient had died of pyæmia. This led to a microscopic examination of the catgut, which was found to contain bacteriae. Herr Zweifel had some catgut which he was going to use in an operation for ovariotomy examined under the microscope, and a large number of bacteriae were discovered in it. As the catgut had always been kept in carbolized oil, this seems to prove that bacteriae possess a certain immunity against carbolic acid. In what way the microscopic organisms penetrated into the catgut is not quite clear. The author thinks that it is very probable that they may have been developed even in the well-stoppered bottle, as carbolic acid is very apt to evaporate, especially if kept in a warm room. This circumstance may possibly explain many cases of death from pyæmia, which has supervened in spite of the most elaborate antiseptic precautions.—*Lond. Med. Record*, Aug. 15, 1879.

Treatment of Cancer of the Thyroid Body.

Dr. C. KAUFMANN, of Berne, in the concluding section of an elaborate contribution on malignant struma—primary sarcoma and carcinoma of the thyroid body, gives the following instructions as to treatment (*Deutsche Zeitschrift für Chirurgie*, Band ii, Heft 5 and 6). Extirpation has been rarely performed, and, in most instances, with a fatal result. The attention of surgeons has, however, again been directed to this operation in consequence of the success that has recently attended its performance in two cases of cancer of the thyroid body under the care of Billroth. The prospects of recovery after such proceeding can never be regarded as favourable, but still the question of operative interference is usually considered in the presence of a certainly fatal affection of any superficial organ. Two operations have been proposed for the removal of cancer of the thyroid; scooping out of the growth—*évidement*, and extirpation. The former operation is applicable only to recent cases and those in which the morbid growth is not very extensive. The structure of the tumour must be soft and pulpy. *Évidement* is a much less dangerous and less difficult proceeding than extirpation. The success of the operation will depend, on the one hand, on the removal of the whole of the growth by sharp spoon and cautery, and, on the other hand, on the absence of any metastatic growths. When the cancerous growth is large and its structure firm, no operation short of total removal of the thyroid body can afford any chance of permanent relief. This operation, to be successful, must be performed at an early stage of the disease, since primary cancer of the thyroid body is speedily associated with metastatic deposits in other organs. These conditions being favourable, the operation is further indicated when there is no very extensive adhesion of the skin to the front of the diseased thyroid body, when the tumour rises during movements of deglutition, and so does not

extend far towards the mediastinum, when the borders of the tumour are well defined, and when the whole mass is freely movable in all directions.

Unfortunately, it will always be very difficult to make out before operating whether there be any adherence or not of the tumour to muscles, large vessels, trachea, and oesophagus. Extirpation, even when performed under the most favourable conditions, must necessarily be a prolonged and tedious operation. The administration of an anaesthetic is usually attended with much difficulty in consequence of stenosis of the trachea, an almost constant result of malignant enlargement of the thyroid body. Whether in cases of isolated disease of one lobe, the whole thyroid body, or merely the affected part, should be removed, would depend on circumstances, especially on the size of the portion of gland remaining free. The safer course would be total removal. Dr. Kaufmann is of opinion that the proceeding of extirpation, if applied at an early stage of the disease, and with attention to antiseptic measures, will, in future, have better results. In too many cases, however, of cancer of the thyroid body, the patient applies for relief at a late period, and when the growth has attained a considerable size, and has contracted extensive adhesions to the skin in front of the neck, and to the trachea, oesophagus, and other important deep-seated structures. With extirpation, as with *évidement*, the chief element of success consists in submitting the patient to operative interference at the earliest possible period. The rule that applies to the management of other superficial malignant growths applies with still greater force to like disease of the thyroid body; the sooner the surgeon interferes the more easily will the operation be performed, and the more complete will be the cure.

When the disease is too far advanced to permit of any operation for its removal, the treatment should be directed to the relief of the effects of tracheal stenosis and of difficulty in deglutition, and to the reduction of profuse and exhausting discharges of pus from the ulcerated growth. The relief of the patient in a case of tracheal stenosis from the pressure of the enlarged thyroid body is usually attended with much difficulty, in consequence of displacement of the air-tube. The only operations that can be performed for opening this tube are erico-tracheotomy and inferior tracheotomy, and of these, the latter, when practicable, is to be preferred. The former may be attended with this disadvantage: the canula being applied at the seat of the stenosis is liable to cause, through pressure, perforation of the wall of the trachea, and so to favour the penetration of portions of the malignant growth into the air-passages. When the cancerous thyroid body extends downwards to the root of the neck and cannot be dragged upwards, erico-tracheotomy is the only operation that can be performed. When, in consequence of the extent of the tumour, it is necessary, in order to reach the air-tube, to divide some portion of the diseased gland, this may be best done by the application of the thermo-cautery. The diseased structure can be divided with much less hemorrhage and with greater rapidity by the application of this agent than by the use of the knife. When the wall of the trachea has been involved in the disease, tracheotomy may be attended with indirect changes, in consequence of some free portion of the soft cancerous structure being drawn into the canula. The operation is indicated chiefly in those cases in which the respiratory disturbances have just commenced. It is very necessary to support the strength of the patient in cases of malignant struma. The obstruction to deglutition will necessitate the use of the oesophageal tube in feeding, and subsequently the use of elysters. A like danger to that attending the wearing of a tracheal canula may follow the passage of a long tube into the stomach, the wall of the oesophagus may be perforated, and portions of cancerous growth penetrate into the alimentary canal.

The amount of suppuration may be reduced by removing from time to time ulcerated and gangrenous portions of the cancerous growth. This may be done by the use of the knife or sharp spoon, or by applying the actual cautery, and the raw surface should then be submitted to the action of a strong solution of chloride of zinc. By such treatment, rapid breaking down of the tumour, and consequent profuse discharge, may be controlled to a considerable degree.—*London Med. Record*, Aug. 15, 1879.

Excision of Pylorus.

M. PÉAN, the well-known surgeon of St. Louis Hospital, has recently performed an operation which has considerably occupied the minds of the medical world in Paris. The patient was a man suffering from cancer of the pylorus, and was, at the time of the operation, in the last stage of cachexia, he not being able to retain any food in his stomach, and having to rely almost entirely on nutritive enemata for sustenance, which, as usual, were found to be insufficient. He accordingly applied to M. Péan to take some operative measures to relieve him, or, if nothing could be done, he was decided, he said, to put an end to his life. M. Péan, rather reluctantly, agreed to comply with the entreaties of the patient and his relatives, and decided to attempt an operation. An incision, about ten centimetres in length, was made on the left side of the umbilicus and parallel to the linea alba. When the peritoneum was opened the stomach was found to be considerably dilated, extending downwards as far as the pubic arch. Its walls were greatly hypertrophied. The peritoneum did not seem to be affected in any great degree. The pyloric portion of the stomach was then gently drawn forwards, when it was found that the growth measured six centimetres transversely and four in a vertical direction. The whole of this mass was excised, as was also a portion of the epiploon, which was diseased. The two surfaces of section were then drawn in contact by means of catgut sutures. No liquid of any kind was allowed to enter the peritoneal cavity during the operation. The abdominal wound was closed in the ordinary manner. The operation lasted two hours and a half. For the first two days after the operation the patient was fed by the rectum, but on the third day some food was allowed to be introduced into the stomach. During the first three days the pulse remained alarmingly weak, consequently it was decided to perform transfusion. Fifty grammes of blood were introduced into the median cephalic vein on a first occasion, and subsequently eighty more were injected. Unfortunately his condition did not improve, and he died on the night of the fourth day. He had shown no signs of peritonitis during these four days. It is much to be regretted that it was not possible to obtain permission to perform a necropsy, as it would have been highly interesting to see what had become of the catgut sutures, and to know whether the intestinal wound showed any signs of uniting.—*Lancet*, June 7, 1879.

Extirpation of a Floating Kidney.

Dr. A. W. SMYTH, of New Orleans, records (*New Orleans Medical and Surgical Journal*, Aug. 1879) the following successful case of extirpation of the kidney:—

Mrs. H. A., aged 35, childless, of medium stature and delicate build, consulted Dr. Smyth in April, 1879, and gave the following history of her case:—

Eight years previously, she began to be afflicted with a pain in her right side. Shortly after the commencement of this pain, she discovered a tumour in her right side, to which she attributed her suffering. She tried various remedies for the relief of her pain, without any benefit. In 1873, Drs. Wilkinson and Calloway, of Galveston, performed on her the usual operation for ovarian tumour,

without removing the cause of her trouble. The year following, her suffering still continuing, Dr. Greenville Dowell, believing that the pain was owing to the mobility of the tumour, passed a large curved needle with a tape-seton through the walls of the abdomen, and through the tumour, with the purpose of causing adhesion, so as to prevent the moving of the tumour in the abdomen. Some haematuria was noticed after this operation. The seton was retained for three months, and gave some relief. At the end of that time the tape broke and came away. The seton caused a persistent offensive discharge from the wound.

Six months afterwards, Drs. Calloway and Penny—Dr. Dowell being absent from Galveston—attempted twice to re-introduce the seton. But on both occasions, broke their needles, leaving the broken ends in the abdomen.

Two months later, Dr. Dowell introduced the seton again, but without giving as great relief from pain as in the first instance.

From continual suffering after this, her mind gradually became impaired, and in June, 1875, she was taken to the State Lunatic Asylum, in Austin, Texas, where she remained for two years. During her confinement there, the second seton came away.

In November in 1878 she had recovered sufficiently to return home. She then went to New Orleans and applied for relief to the Charity Hospital, and her tumour was then diagnosticated as a floating kidney. In April, 1879, she was brought to Dr. Smyth to have the kidney removed, for which she was extremely anxious. The operation was performed on the 3d of June.

The operation was commenced by making an incision in the right side of the lumbar region, extending externally from the crest of the ilium to the edge of the eleventh rib, two and a half inches by measurement from the median line of the spine and parallel with it. Internally the incision extended to the edge of the twelfth rib. The muscles and the transversalis fascia having been divided, search was made for the kidney, which was found in the umbilical region. The kidney, by pressure upon the abdomen, was forced into its place, and while held there by an assistant, the fascia covering the kidney was ruptured by the finger, and the organ was extracted without difficulty. While still in the wound, a strong ligature was passed around the renal vessels and other connections, at a distance of less than an inch—perhaps, about a half an inch—from the hilus; and the organ was then detached. No elongation of the connections of the kidney was observable. Nothing worthy of special note—much less anything untoward—occurred during the operation. At its conclusion, two sutures were inserted, to bring the edges of the integuments together, in the upper part of the wound, the ligature being left hanging out of the lower part. The wound was dressed with a solution of carbolic acid, of the strength of one drachm to a pint of water. A hypodermic injection of half a grain of sulphate of morphia was administered, and repeated at bedtime.

On the day following there was slight febrile disturbance, which increased on the third day, when the temperature reached 103° F., and the pulse 100. On the fourth day the temperature was 102° F., and the pulse 80. On the fifth day the temperature was normal, and the pulse 70. Very free suppuration occurred from this time to the tenth day, when the ligature came away. On the eleventh day, the patient got up and walked about without pain. She complained of little or no suffering after the operation; and objected to the use of the hypodermic injection on account of the pain it gave her, after the fourth day. No medicine, whatever, of any kind—not a dose of anything—was given to the patient, either before or after the operation; the only treatment used being four hypodermic injections, of half a grain each, of sulphate of morphia.

The kidney removed was found to be of normal size, but to be scarred with a

deep cicatrix, extending, from the inferior and outer edge, obliquely up, and out, and apparently through the pelvis. The length of the cicatrix was about two inches and a half. It was evidently the result of the seton introduced, which had cut its way completely out of the organ.

The operation has been followed by complete recovery; and the patient no longer complains of the trouble afflicting her, on account of which it was undertaken.

It may be worthy of special note that in this case of Dr. Smyth, the operation was performed through the lumbar region, that it was found not difficult of performance, and that it was not followed by any apparent dangers or risks.

[This makes the eighteenth case which we have from time to time recorded in this JOURNAL, with a mortality of 50 per cent.]

On an Operation for the Relief of Patients who Suffer Severely from Long-standing Hypertrophy of one Prostate, or from Vesical Tumour, with Retained Urine.

Sir HENRY THOMPSON, in a communication to the Royal Medical and Chirurgical Society (*British Medical Journal*, June 7, 1879), asked whether, when a patient had long ceased to pass urine by his own efforts, and had to pass the catheter with great frequency and often with pain and difficulty, it might not be desirable to place a tube *en permanence* in the bladder, making an opening above the pubis for the purpose. This might be done safely and simply, since there was a route into the bladder, by means of a staff, as in the high operation for stone. But as, in these cases, the bladder was usually small and contracted, it was to be opened rather *behind* than *above* the symphysis pubis, so as to make certain of not injuring the peritoneum. This might be done without difficulty by following the instructions laid down. In performing the operation, a curved hollow sound was used, having a stylet with a bulbous end. The sound being introduced into the bladder, the point was made to project against the wall of the organ just behind the symphysis. A small incision being then made, the end of the staff was sought with the finger, and the bladder carefully perforated; care being taken not to make the incision too large, so as to avoid the escape of urine by the side of the tube to be introduced. A gum-elastic tube, having a shield like that of a tracheotomy-tube, was then passed into the end of the sound (the stylet having been withdrawn), and thus introduced into the bladder. Some care was subsequently required to keep the tube clean; but the relief produced was great. The author had applied the proceeding only in very extreme circumstances, with the view—in which he had succeeded—of rendering the short remains of a closing life tolerable—viz., in three cases for hypertrophied prostate, in one for cancer, and in one for villous tumour. He proposed the question—May it not be desirable to adopt such a procedure in some instances at a somewhat earlier period in the history of such cases?

Dr. KEYES, of New York, had had under his care a case which he had treated in a manner similar to that described by Sir Henry Thompson. The patient was a gentleman aged 60, who for some time had been the subject of prostatic obstruction, the effects of which at last became much aggravated. Dr. Keyes made an opening above the pubes, and introduced a double tube about three inches and a half or four inches long, having a plate like that of a tracheotomy-tube. The patient wore the tube, with much relief, during more than nine months, and at last died of some other disorder. The shield of the tube was fitted with a universal joint, which was very useful in enabling the patient to wear it with comfort.

Mr. TEEVAN said that Sir H. Thompson's paper was very valuable in directing

the surgeon's attention to what could be done for the relief of obstruction. A man who was obliged to use a catheter was as certainly condemned to die as if he had cancer; it was only a question of time. As age advanced, he became less capable of using the instrument, and perhaps made a false passage; and possibly a course of management would be followed which would lead to cystitis. Was it not justifiable in certain cases to endeavour to remove the cause of the complaint? Removal of prostatic tumours had been done, and was really not a dangerous operation. An incision in the middle line of the perineum or through the rectum was preferable to the incision as for lateral lithotomy.

Sir HENRY THOMPSON said that it was very rare to find a polypoid pedunculated prostatic growth that could be removed by operation. The enlarged prostate was generally a rounded or shapeless mass, incapable of removal. He was not aware of one case of operation for the removal of polypoid growths, though they had been removed during lithotomy. It often happened that portions of the prostate were shelled out and removed in the lithotomy forceps. He did not think that the condition of persons who were obliged to use the catheter was so gloomy as Mr. Teevan represented. He knew a gentleman who died at the age of ninety, after having used a catheter twenty-two years; and another gentleman at Norwich told him that he had used the catheter thirty-five thousand times. In the researches which he made some years ago, in conjunction with Dr. Messent, on the old men in Greenwich Hospital, they found the average age at death to be 73; while that of those who used the catheter was $72\frac{3}{4}$ years. He protested against causing men who used the catheter to believe that life was thereby shortened. With regard to the removal of tumours from the bladder, it was necessary to bear in mind Mrs. Glasse's precept. "First catch your hare," and to be sure that there was a tumour. There was no novelty in his operation, except that he performed it when retention was not actually present, and retained the tube.

Lithotripsy at a Single Sitting.

Sir HENRY THOMPSON has recently placed on record (*British Med. Journal*, Aug. 2, 1879), his experience of the method of removing calculus from the bladder at a single sitting, as first advocated in the columns of the *American Journal of the Medical Sciences*, by Dr. Henry J. Bigelow, of Boston.

In all his cases Sir Henry used his own lithotrites with the cylindrical handle; but he has also employed for the latter three cases a more powerful instrument, although but very little exceeding in size those he has hitherto employed. This has been applied chiefly during the first part of the procedure; viz., that of breaking the stone into large fragments. The difference in this new lithotrite consists in making the lower part of the male blade keel-shaped, or like the prow of a ship, while the upper part is still flattened; so that the instrument may execute powerful cutting and crushing actions simultaneously. The male blade is also placed at right angles with the shaft, and thus acts at great advantage in comparison with a blade diagonally placed. At the same time, the female blade retains its curve, enabling the instrument to be introduced with as much facility as heretofore. Lastly, he thickened the sides of the latter, and enlarged the opening to admit the prow of the male blade to enter it and drive out any débris which—with the increased amount of work now required—might otherwise lodge and impact the blades. In all his cases Sir Henry employed his improved aspirator.

Sir Henry's cases are thirteen in number, and all were successful. The mortality was *nil*. He considers the result encouraging. "There is one observation I may make," he says, "and it is this: When the great bulk of a calculus of considerable size has been removed, say in fifteen or twenty-five minutes, or thereabout, and it is quite obvious that a small piece or two only remain, I would

advise that, if another effort or two to remove these last be unsuccessful, it is better not to repeat fruitless manipulations, but to give over the search to a future attempt. As far as my brief experience above given enables me to judge, it is wise, I think, to leave, as I did in three or four cases, a fragment or two, which seemed unwilling to be caught, until a day or two later, when they may be found in a tranquil bladder without difficulty, and meantime had clearly done no harm.

"Lastly, there is a fact about which I have now no manner of doubt; viz., that large and clumsy lithotrites are unnecessary for our purpose; and that the instruments which I have described above are more efficient, safe, and speedy in their action than the large and unwieldy lithotrites which have been proposed."

Villous Disease of the Bladder.

Dr. ROBERT S. HUDSON reports (*Dublin Journ. of Med. Science*, June, 1879) an extremely interesting case of this rare affection in which the disease lasted for upwards of eleven years. When it first appeared the patient was treated with injections of a solution of nitrate of silver at intervals for several weeks, and he was apparently completely cured for eight years, when his old symptoms reappeared, and he consulted Dr. Hudson. Three years later he died, and at the autopsy there were found eight tumours, each connected by a narrow pedicle, which might have been ligatured, avulsed, or treated with the écraseur.

From a careful study of the case and of the literature of the disease Dr. Hudson offers the following conclusions:—

1. Villous disease of the bladder is not so rare as is generally supposed—many so-called cases of chronic cystitis being probably due to it.
2. Its diagnosis is most difficult, and can only be arrived at after long observation, and by a process of exclusion.
3. Urinary deposits containing so-called cancer cells are very misleading, but the microscope is most valuable in detecting small portions of genuine villous growth.
4. There should be no difficulty in detecting the growths in the female, as the whole internal surface of the female bladder can be readily explored with the finger after rapid dilatation of the urethra, when under the influence of an anaesthetic.
5. Astringent injections are likely to be of use in the early stages, and before the growths have become pedunculated.
6. The surgeon, while unsparing in the use of sedatives to relieve pain and spasm, should bear in mind the possibility of permanent cure by removal of the growth.
7. Statistics show that the operation is neither difficult nor dangerous in the female; and there are good grounds for believing that when preceded by cystostomy in the adult male it will prove justifiable and satisfactory.

Lymphadenoma of the Testis.

Profs. MONOD and TERRILLON terminate a paper in the *Archives Générales* for July with the following conclusions:—1. Lymphadenoma or tumor constituted by a tissue of new formation comparable to that of lymphatic glands may be developed in the testis. 2. It constitutes a variety of varicocele which is quite distinct in an anatomical point of view, the diagnosis of which, in the living, is not impossible. 3. It seems to affect the gland itself by preference, sparing the epididymis. 4. From the commencement the gland is attacked throughout its whole extent. The degeneration seems to commence in the intra-tubular cellular tissue, and invades secondarily the walls of the seminiferous tubes, which dis-

appear themselves in proportion as the neoplastic tissue extends. 5. The lymphadenoma may occupy both testes simultaneously—a fact that appears special to this variety of neoplasm of the testis. 6. Generalization takes place early and rapidly. Of frequent occurrence in the viscera and the bones, it may also involve entaneous and subcutaneous tissue situated at a great distance from the primary seat of the disease. This and the preceding characteristic may prove of great utility in the diagnosis of the disease. 7. This infection of the economy may, during a relatively long period, not give rise to any appreciable cachexia. 8. This lymphadenoma does not appear to be accompanied by leukæmia. 9. Prognosis is fatal, and surgical intervention up to the present time has always proved useless.—*Med. Times and Gaz.*, Aug. 9, 1879.

Etiology of Hip-Joint Disease.

In a communication to the *Lancet* (Aug. 2, 1879) Mr. RICHARD BARWELL, Surgeon to Charing-Cross Hospital, London, calls attention to the connection between phimosis and hip-joint disease. A good many years ago I was struck, he says, with the fact that nearly all the boys we admitted for hip disease into Charing-Cross Hospital had congenital phimosis. In a short time this coincidence was found to be nearly, if not quite, constant. At last, in the middle of 1873, I determined to note, in a hundred male cases of hip disease occurring in my private practice, or admitted into hospital, the presence or absence of this condition. For the sake of better classification phimosis was divided into three classes: 1st degree, the opening in the prepuce a mere pinhole, so that on retraction no part of the glans, or only a minute portion of the urethral lips, could be seen. 2d degree, in which a considerable part of, or all but nothing beyond, the urethral orifice could be uncovered. 3d degree, in which the prepuce, when retracted, uncovered some portion, but only a portion, of the glans. 4th degree, elongated prepuce projecting more than a quarter of an inch beyond the glans, but capable of entire retraction. 5th degree, normal.

Table of 100 Cases of Hip Disease in Male Children under Ten Years of age.

1st degree.	2d degree.	3d degree.	Elongation.	Normal.
39	27	17	11	6

The same divided into ages.

Years.		1st degree	2d degree.	3d degree.	Elongation.	Normal.
2 to 4	.	.	3	2	0	1
4 to 6	.	.	7	5	2	3
6 to 8	.	.	16	11	9	4
8 to 10	.	.	13	9	6	3

The first line of this table is very significant when it is considered that the cases are not picked or chosen, but represent every hip disease in the male that came under my notice,¹ from the end of 1873 up to the middle of 1878, when my number was complete. It will be observed that of these cases 83 have phimosis, that only 6 have normally formed prepuce, and that from complete, or the first degree of phimosis, to which class more than one-third of the cases belong, the number steadily declines to the normal. I would also point out that these are not fortuitous coincidences, because for two years at least before commencing tabulation this association was remarked. Furthermore, I asked my friend, Mr. Morrant Baker, to inquire for me about the prevalence of hip disease at the Eve-

¹ My colleagues at the hospital had kindly permitted me to make use also of their cases for statistical purposes.

lina Hospital, which is largely used by Jews. He tells me that few children are there admitted for hip disease, and that most of those so received belong, not to the Jewish, but to the Christian community. I have appended also the second part of the table—that which divides the cases into ages—although I think in certain ways the division is not very reliable; for finding it impossible to ascertain from the accounts given by parents the exact period of commencement, the age at which I saw the child or admitted him into hospital has been recorded. Children of course came under my notice in all stages of the disease; hence the table shows nothing as to the time at which the malady commenced.

The important fact, however, is simply coincidence of phimosis and hip disease—a coincidence which I should never have dreamed of or imagined had it not been forced on my observation. Upon the mode in which the one influences the other I would rather not speculate further than to point out that phimosed children have facile, frequent, and often long-continued priapism; that this condition, unnatural in the infant, must produce after a time a certain irritability or irritation of the lumbar spinal cord; that from this part the various nerves of the pelvis and lower limb are given off; that the influence of spinal irritation on the trophic nerves is well known, and that just at this particular period large trophic changes are in progress about the hip-joint.

Of course, I have not overlooked the fact that hip disease also occurs in female children, though I believe less frequently than in the male.¹ I regret exceedingly that I did not simultaneously tabulate such cases, as I am now engaged in doing; but this I can say with certainty, that in a large proportion of girls afflicted with hip disease will be found vulvitis, even vaginitis with or without discharge, and generally, I believe, produced in the first instance by thread-worms creeping from the rectum to the vagina. In a certain proportion will be found protruding nymphæ covered by a cuticular surface. Further than this, as my numbers are incomplete, I am disinclined to go. The inference as to treatment of male cases in the earlier stages is obvious.

The Disturbance in the Growth of the Long Bones after Necrosis of the Diaphysis.

In this paper Prof. HELFERICH gives (*Deutsch Zeit. f. Chir.*, Bd. x.) careful measurements of the affected region in 141 instances in which necrosis had attacked some part of one of the long bones. He shows that the relation between liability to disease and the rate of growth in a bone, and also in the upper and lower ends of a bone, has been already noted by other observers, and on the whole is correct. The chief exception is the tibia, which is more liable to necrosis than the femur, though its rate of growth is less. This is explained by the greater liability of the tibia to injury, which also causes its shaft to be more frequently affected than that of other bones. With this exception, necrosis is most frequent near the ends of the diaphyses, and in each case near that end at which the growth is the greater.

The numerous careful measurements which the author has made show that interference with the growth of the part affected is frequent, and he suggests that it is often overlooked in consequence of its being, in some instances, slight, and in others masked by a compensatory greater natural growth in the bone or bones of another segment of the limb. In the femur he found 13 instances of shortening to 3 of lengthening; in the tibia, 12 of shortening to 14 of lengthening; in the humerus, 4 of shortening to 1 of lengthening; in the radius, 2 of shortening. These interferences with the length do not take place after the growth of the bone has ceased and after the epiphyses are ankylosed to the shafts. They

¹ During the time that I was noting 100 male cases I saw only 73 female cases.

depend upon some influences exerted on the epiphyseal cartilages by the disease. The lengthening is due to the prolonged hyperæmia attendant upon necrosis extending to the epiphyseal cartilage, and giving an impetus to the cell formation there; and it is most frequent in the tibia, because the necrosis in that bone frequently affects the shaft; whereas in other bones the disease, in consequence of its being nearer to epiphyseal cartilage, is more likely to cause destruction of the cartilage and consequent arrest of growth. Examples are quoted in which disease of the epiphyses, occurring in affections of joints, was attended with elongation of the bones, but that is rare in comparison with shortening from this cause. He alludes to the possibility of necrosis causing impairment and destruction of the nearest epiphyseal cartilage and arrest of growth at that, the proximal, end, and merely inducing hyperæmia and increase of growth at the other and more distal end. Thus there would be diminution and increase of growth in the same bone, and produced by the same disease, affecting the two ends in an unequal degree.

The lengthening of the adjacent bones, which, though rare, may be associated either with lengthening or shortening of the diseased bone, is in either case to be attributed to the accession of blood-supply to the limb, which is in some way brought about by the disease, and like the similar change in diseased bone, it must be limited to the growing period of life.

The associated shortening of the adjacent bones may be attributed, as indeed may sometimes in part be that of the diseased bone, to inactivity of the limb. It is most frequently observed when the disease is in the proximity of a joint, the use of the limb being in such cases interfered with most.

The associated elongation of the adjacent bone, as in the case of the fibula when the tibia is elongated, may depend upon the accession of blood extending to the fibula, or, upon tension exerted upon it by the growing tibia, or by both causes. The resistance of the fibula may, however, limit the elongation of the tibia, or may cause it to assume a curve, as has been observed by Paget and Stanley. In some instances, however, the fibula has not been thus elongated, but has undergone luxation from the upper part of the tibia, its lower end remaining fixed to the tibia, and the upper end being drawn away from it. Two cases of shortening of the tibia were observed by Humphry, in one of which the upper end of the fibula was luxated, and projected above its articular surface in the tibia, and in the other the lower end projected downwards and touched the ground. Other deformities resulting from the unequal length of the two bones of one segment of the limb are mentioned.—*London Med. Record*, July 15, 1879.

Reproduction of the Tibia after Osteomyelitis.

At a recent meeting of the Gesellschaft der Aerzte in Vienna (*Allg. Wien. Med. Zeit.*, No. 24, 1879), Professor WEINLECHNER presented a lad, aged 17, who in October last had been taken ill with a severe inflammation of the left leg, from the knee downwards. When admitted into the hospital he was in a very precarious condition, a complication with pneumonia had set in, the temperature was permanently high, and he was much reduced in strength by the constant suppuration. When the patient had recovered from the pneumonia, Weinlechner proposed amputation of the leg, as osteomyelitis had manifestly set in; however, as this was objected to, Weinlechner removed the whole diaphysis of the tibia, which had in the mean time become necrotic. The extremity did not present a very slightly appearance after this operation, as the soft parts of the leg hung loosely about the remaining bone. The suppuration, however, decreased rapidly, and three weeks later the whole empty space was filled by osseous neoformation, which had developed within that short time. Five months have elapsed since,

during which time the wound had been healing. It is now completely cicatrized, with the exception of two very small fistulas. The newly-formed tibia is about three centimetres wide in its lower part, it is slightly abducted and not yet quite consolidated, as there is a pseudarthrosis about nine centimetres above the internal malleolus. The knee-joint is movable, and the leg can be stretched out and bent without any difficulty, but suppuration has evidently taken place in the ankle-joint, as the leg is stiff and immovable in that region.—*Lond. Med. Record*, Aug. 15, 1879.

Fracture of the Coracoid Process.

Dr. EDWARD C. HUSE, of Rockford, Ill., records (*Chicago Med. Journal*, August, 1879) the case of a physician who consulted him on account of an injury to his shoulder which he had sustained an hour before. Upon getting out of bed he stumbled and fell, striking his shoulder against the edge of a door standing ajar. The pain was so excessive as to render him unconscious for some little time. Upon careful examination of the parts, Dr. Huse was unable to detect any evidence of injury to the bony parts. There was inability to place the hand upon the head, and extreme tenderness on pressure over a limited space just inside the acromial end of the clavicle and just below it. No crepitus or deformity was at this time observable. Next morning there was circumscribed tumescence, with considerable impairment of function, corresponding to the action of the pectoralis minor and coraco-brachial muscles. It will be remembered that the former is inserted into this process, and also that the conjoined tendon of the latter and of the short head of the biceps arise from its outer border. Crepitation was now quite perceptible. This was doubtless more from rupture of the trapezoid ligament than the separation of the fragments of bone. Indeed, when the relations of this ligament and also of the conoid are considered, it seems that this fracture implies the necessary rupture of both of them.

When we observe that the coracoid process is epiphyseal, and that complete osseous union does not occur till the twenty-fifth year or even later, this case may be viewed more as a separation than a fracture, perhaps. Hamilton, however, considers such separations under the nomenclature of fractures.

The exceeding infrequency of this injury is obvious from a consideration of the anatomical reasons. Nothing but direct violence of a special kind can cause it. Erichsen says only about a dozen cases of fractured coracoid are recorded. Mr. Lizars denies having seen a well authenticated case. Bransby Cooper and Dr. R. Mussey have each seen one. Hamilton has seen but one.

The patient has but little inconvenience at present, no treatment further than elevation of the forearm upon the chest having been employed.

OPHTHALMOLOGY AND OTOTOLOGY.

Ophthalmic Migraine.

Dr. GALEZOWSKI contributed to the June number of the *Archives Générales de Médecine* a paper on ophthalmic migraine, or, to use his own definition, "migraine which localizes itself in the organ of sight." Many authors—English, French, and Italian—have mentioned the occurrence of ocular phenomena as occasional accompaniments of ordinary migraine, but Dr. Galezowski considers that in a certain number of cases these ocular phenomena constitute the whole

symptomatology of the morbid state, and appear to depend on a special localization of the neurosis in question.

He has observed, hitherto, only four varieties of ophthalmic migraine—1, periodic hemiopia; 2, glittering scotoma; 3, amaurosis; 4, photophobia. Each of these varieties usually presents, in addition to the symptom from which it takes its name, either some more or less marked symptoms of ordinary migraine, or else symptoms peculiar to ophthalmic migraine.

There are, however, some cases in which there exists but one single symptom, without anything else whatever to suggest that the case is one of migraine. For instance, when a periodic hemiopia, or a central periodic scotoma persists, as it may do, for some time, the diagnosis becomes very difficult, and it is impossible to speak confidently as to the nature of the disease without a most attentive examination into the previous history and the general state of the patient's health. It will often be found in these cases that the ocular phenomena have been preceded by, and have apparently taken the place of, frequent attacks of ordinary migraine. When the periodic hemiopia or scotoma is frequently repeated, the case becomes disquieting, for all work requiring steady application becomes impossible. A great variety of circumstances may add to the difficulty of the diagnosis in cases of ophthalmic migraine, such as the following: 1. The patient had, not long before the eye-symptoms came on, received a blow on the head. 2. One eye may be reduced to a stump, or the patient may be suffering from general staphyloma. 3. The attack may be complicated by the almost simultaneous occurrence of hysterical amblyopia, and this, Dr. Galezowski says, is not very uncommon. Dr. Bonnal, of Nice, relates the case of a man aged 40, who had been subject since he was 13 years old to periodical attacks (every three or four months) of strabismus and dimness of sight, accompanied by epileptiform symptoms without loss of consciousness. These attacks diminished very much in frequency and violence after he had taken service in the Hammam at Nice as a rubber.—*London Med. Record*, Aug. 15, 1879.

Reflex Action in the Organ of Hearing.

Dr. WEIL (*Monatschrift f. Ohren.*, June, 1878) finds that temporary relief from tinnitus may frequently be obtained by blowing in puffs through a simple tube or a Siegle's speculum on to the walls of the meatus. Many patients thus obtain partial or complete relief from the noise for a quarter or half an hour. In some cases the noises were increased by this proceeding, usually in persons complaining of ringing and whistling sounds. In those suffering from a dull noise, a good result was rarely absent; but, if the blowing was too prolonged or too forcible, the noise sometimes changed to a high clear tone. In some individuals no reaction was obtained. As the author thought of reflex contraction of the blood-vessels, he endeavoured to make the effects permanent by means of injections of ergotine, but without definite result.—*London Med. Record*, Aug. 15, 1879.

MIDWIFERY AND GYNÆCOLOGY.

Action of Pilocarpine on Uterine Contractions.

In August, 1877, Dr. Massman, of St. Petersburg, was led to employ pilocarpine in a dropsical pregnant woman, on account of its diaphoretic properties. She was prematurely confined after the use of the drug. He noticed the same occurrence in February, 1878, and he then published these two observations.

Since then a number of experiments have been made by different investigators, as Schanta, Felseinreich, Kleinwaechter, Parisi, J. Clay, and others. In a thesis on the subject, Dr. MARTI has given an account of these different observations on pregnant women, and also of some experimental researches of his own on animals carrying young. The conclusions he has arrived at are:—

1. That subcutaneous injections of pilocarpine in pregnant females and during labour have had no result, and have in no way brought on uterine contractions.
 2. That the same has been the case in a large number of experiments on animals.
 3. That in certain conditions of the uterus, as when the female or the animal under observation is already in labour, or has come to full time, subcutaneous injections of pilocarpine have the power apparently to set up uterine contractions.
 4. That in this last class of cases the uterine contractions appear some minutes after the injections, increase in frequency for some time, then become stationary, and then quickly cease. In some of these cases the contractions have not been strong enough to complete the labour.
 5. From all the facts observed he concludes that, at full time or during labour, pilocarpine seems to have a special influence on the contractility of the uterus, but before the full time subcutaneous injections are almost always powerless to bring on premature labour.—*Glasgow Med. Journal*, August, 1879, from *Le Progrès Méd.*, May 10, 1879.
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Use of Benzoate of Soda in Puerperal Fever.

LEINEBACH reports (*Allg. Med. Centr. Zeib.*, No. 55, 1879) four cases of puerperal fever which were cured by the use of benzoate of soda. Two of the patients were primiparæ, the other two multiparæ. In both cases of the primiparæ, quinine was given in doses of one gramme, besides the benzoate of soda, as the temperature had risen to 105.8 degs. in the first day after the child's birth. It sank immediately to 100.4 degs. The patients took the quinine without any difficulty, and did not vomit it again, as had happened in one of the cases where it was given alone, without the benzoate of soda. The temperature remained normal. It appears that the author is not acquainted with the case reported by Professor Petersen of Kiel, where the life of a woman in puerperal fever was saved by large doses of quinine and benzoate of soda.—*London Med. Record*, Aug. 15, 1879.

Laceration of the Cervix Uteri.

Dr. SPIEGELBERG, who has had occasion to operate in ten cases of this affection, gives preference to Emmet's method. (*Bresl. Aerztl. Zeitschr.*, 1879; and *Centralblatt für die Med. Wissen.*, No. 18.) He thinks that chronic endometritis and a disturbance in the progress of involution of the uterus are often due to eversion of the os uteri and to laceration of the cervix; and that the latter often is the direct cause of endometritis of the neck, and the indirect cause of leucorrhœa and more serious affections of the mucous membrane of the cervix, so as to cause, under certain conditions, sterility and abortion, and perhaps even prove a great impediment to a successful treatment of retroflexion and retroversion of the womb. In some cases, a cure would be effected by healing the lacerations; while in other cases the patient recovered by being kept very quiet and treated antiphlogistically. He does not agree with Emmet in insisting on a preliminary treatment of the affections in every case; he thinks that this is only indicated in cases where the mucous membrane has undergone intense follicular changes. The operation must be performed with antiseptic precautions; but

there is hardly any need for anaesthetics. The patient is laid on her back, if the uterus can be easily drawn down; if not, she must be placed either on the right or the left side, according to the lacerations. Spiegelberg uses metal wire. The wire is generally removed on the tenth day, and the patient is allowed to leave her bed on the eighth day. Little must be done in the way of treatment, except keeping her quiet. Out of the author's ten cases, the wound healed by first intention in six; in three, by second intention; and in one case, one side did not heal at all.—*British Med. Journal*, July 12, 1879.

Treatment of Uterine Fibroids by Ergot.

Dr. G. ERNEST HERMAN, Assistant Obstetric Physician to the London Hospital, in a paper read before the Hunterian Society (*Med. Times and Gaz.*, Aug. 23, 1879), considers this subject and offers the three following propositions as being warranted by the facts before the profession.

1. That ergot will often produce the diminution in size, and sometimes even complete absorption, of fibroid tumours of the uterus, and will, in the majority of cases relieve their symptoms.
2. That these effects will often follow the administration of the drug by the mouth, but will more certainly be produced by its hypodermic injection in the neighbourhood of the tumour.
3. That in all cases in which treatment is required, except those in which surgical interference is needed to avert immediate danger to life, this treatment should be tried before resorting to operative measures.

Oophorectomy in a case of Congenital Vaginal Defect.

At the eighth Congress of German Surgeons, held in Berlin last April, Prof. VON LANGENBECK (*Wiener Medizin. Wochenschrift*) exhibited a woman, aged 23, on whom he had performed Battey's operation. She had been married three years. The eatamenia commenced at the age of 14; and, as was afterwards discovered, the discharge took place *per urethram*, the vagina being entirely absent. The discharge was scanty, but was always attended with severe pain. Coitus was also effected by the urethra. As the menstrual troubles had lately increased to such an extent as to produce epileptiform attacks, Dr. von Langenbeck decided on extirpating the right ovary by Battey's method. He had ascertained by careful examination that the left ovary was wanting, and that the uterus was rudimentary. An incision about two inches long was made in the flank; the pedicle of the ovary was tied with catgut, and sewn to the abdominal wound. The process of healing was uninterrupted; the ligatured remains of the pedicle fell off on the fourteenth day. Menstruation took place on the fifth day after the operation, although one ovary was removed, and the absence of the other had been ascertained both before and during the operation. Dr. von Langenbeck expressed his satisfaction with the result obtained, and recommended the proceeding for adoption in similar cases.—*British Med. Journal*, July 12, 1879.

The Treatment of the Pedicle in Ovariectomy.

Professor SPIEGELBERG reports (*Berliner Klinische Wochenschrift*, May 5, 1879) the result of thirty-five hospital cases of ovariectomy performed according to Lister's antiseptic method in its fullest extent, with special reference to the question as to what treatment of the pedicle is most suitably combined with the antiseptic method. Of these thirty-five cases, only 5, or 14 per cent., died; whereas in forty-five operations previously performed by him without the carbolic spray, twenty patients, or 45 per cent., died. The present series of cases Spiegelberg brings forward to show that it is possible, in conjunction with the antiseptic

method, to adopt the extra-peritoneal method of treating the pedicle with at least as great success as if it were ligatured and returned. Of the two methods he is inclined to prefer the treatment by clamp. Of nineteen cases treated with the clamp, eighteen recovered; while, of sixteen in whom the pedicle was ligatured and dropped, four died. In the latter, however, were included the most difficult cases. The author admits some degree of force in certain objections to the use of the clamp, namely, the frequent occurrence of suppuration in the lower angle of the wound, the slower healing of the wound, and the formation of a broader and less firm cicatrix at its lower angle. He does not consider, however, that, with due care, there is any danger of the pedicle slipping back into the abdominal cavity, or of septic material finding access to the raw end of the pedicle; and he has not found in his experience any deleterious after-effects, either with regard to menstruation or pregnancy, from the adhesion of the pedicle to the abdominal wall. His great objection to the intra-peritoneal mode of treating the pedicle is that pelvic suppuration later on, set up by the presence of the ligatures, is by no means very rare in patients thus treated. He therefore concludes that the future of patients with a clamped pedicle is a safer one than that of those in whom the pedicle has been ligatured and returned.—*Obstet. Journ. of Gt. Britain*, Aug. 1879.

In an article in the *Finska Läkarasällskapets Handlingar*, Band xix., Dr. F. SALTZMAN relates the histories of seven cases of ovariectomy recently performed by him, and makes some remarks on questions bearing on the operation. In six of the cases, as in all the similar operations previously described by him, he used the actual cautery in the treatment of the pedicle. The most important objection against this method, namely, that it does not afford a sure protection against secondary hemorrhage, may, in his opinion, be obviated by taking the precaution to tie each vessel in the pedicle with catgut. If it be desired to again ligature the pedicle, he regards catgut as the most suitable material. From his own observations and from those of others, the author has come to the conclusion that the fear lest the catgut ligature should fail to afford security against secondary hemorrhage, in consequence of its ready absorption, has been exaggerated. The author points out some inconveniences of the extraperitoneal method of management of the pedicle, among which he especially directs attention to the occurrence of tetanus in some of the cases treated in this way, and sums up by declaring his preference for the intraperitoneal method. This method is applicable in all cases, and the only important point is the choice between the ligature and the actual cautery. He decidedly prefers the cautery when one has to deal with a thick pedicle, especially when no large arteries can be detected in it. The ligature is indicated, in the first place, when the pedicle is comparatively thin, and contains arteries of large calibre; and it is absolutely required in cases where the pedicle is so short that the cautery-clamp cannot be applied, and where the tumour cannot be shelled out so as to form a pedicle. With regard to the use of the drainage-tube, especially in Douglas's pouch, Dr. Saltzman regards it as applicable only in some very rare exceptional cases. Of his seven operations, two were followed by death. He gives reasons for the use of antiseptics in the operation.—*British Med. Journal*, July 12, 1879, from *Nordiskt Med. Arkiv*, Bd. xi.

MEDICAL JURISPRUDENCE AND TOXICOLOGY.

Antidotes for Strychnia.

Dr. HUSEMANN has confirmed (*Arch. f. exp. Path.*, x. p. 101) the experiments of Amagat that in cases of poisoning by small doses of strychnia, the

treatment with alcohol is to be preferred to the treatment by chloral. The reason for this is, that the quantity of alcohol required to neutralize the small but fatal dose of strychnia is not dangerous to life, although such may be the case from the amount of chloral administered. In investigations upon rabbits, absolute alcohol mixed with an equal portion of water to prevent the local coagulation of albumen, was found to cause death when administered in doses which are described by Amagat as innocuous. He thus shows the great difference in the susceptibility to alcohol which is found alike in rabbits and in man. It is therefore a matter of greater difficulty to define the exact dose of alcohol than of chloral which is necessary in a case of strychnia intoxication. As a result of his experiments, in which the author has only occasionally counteracted $1\frac{1}{2}$ times the deadly dose of strychnia by the treatment with alcohol, the advice is given that no more alcohol should be administered than is necessary to counteract the minimal lethal dose of strychnia. Chloral is a still more certain remedy in cases of strychnia poisoning, even when the amount taken has been five or six times the deadly dose, whilst alcohol is unavailing if but two or three times the minimal lethal dose has been taken. The author has also found that a rabbit recovered from a single deadly dose of strychnia when it had been rendered insensible with physostigma. After larger doses of strychnia, however, the reflex irritability of the animal experimented upon was scarcely lessened by the physostigma, so that the antidotal effect of this drug is less than that of alcohol. Dr. Husemann therefore holds that physostigma is entirely useless as an antidote for strychnia poisoning, and he considers that the treatment with chloral is as yet the best method for any who are suffering from the effects of poisoning by strychnia.—*Practitioner*, Sept. 1879.

Treatment of Strychnia Poisoning.

RIVINE (*Centralblatt f. die Med. Wiss.*, Jan. 25, 1879), in a case of strychnia poisoning in a girl of 16, has found that 40 grains of potassium bromide, and 10.20 grains of chloral hydrate were of great use, whilst 120 grains of potassium bromide or 40 grains of hydrate of chloral are necessary by themselves. He therefore recommends the combination of the two remedies in the treatment of cases of poisoning by strychnia. To test this theory, his pupil, Hessler, has carried out certain experiments on rabbits. For this purpose Hessler has investigated the mode of action of potassium bromide on the sleep produced by chloral hydrate. He finds that the simultaneous administration of the former drug does not appreciably prolong this sleep. That sensation and reflex irritability are never completely abolished. That the danger of a fatal termination would not be diminished in narcosis produced by the administration of four-fifths of the minimum lethal dose of chloral hydrate with the addition of potassium bromide in a small dose (about one-third of the lethal amount). In ten cases of the minimal lethal doses of strychnia the method advocated by Rivine was not of more use than the simple chloral treatment; by both methods the tetanus which threatened life was allayed, and consequently life was prolonged. The duration and intensity of the attack was lessened to the greatest extent when the chloral mixture was given. When the minimal lethal dose of chloral hydrate was not exceeded, a sudden diminution in the frequency of respiration and death from chloral poisoning occasionally occurred. The ultimate conclusion to which the experiments have led is that the simple treatment of acute strychnia poisoning by means of chloral hydrate is decidedly superior to the combined method proposed by Rivine.—*Practitioner*, June, 1879.

AMERICAN INTELLIGENCE.

ORIGINAL COMMUNICATIONS.

Case of Gunshot Wound of the Heart: Death on the Thirteenth Day.
By H. W. BOONE, M.D., Resident Physician at the City and County Hospital, San Francisco, Cal.

CHARLES KLINE, at. 36, a German farmer, was admitted to the City and County Hospital of San Francisco, at 1 P.M., June 2, 1879. He presented the appearance of a strong, hearty, and well-nourished man. States that, twenty-four hours previously, he accidentally shot himself while practising with a pistol, carrying a ball of $\frac{3}{16}$ calibre. He was taken to the City Receiving Hospital, and the ball was extracted from his back. Is very feeble and faint; can only speak in a whisper; pulse 112; respiration 22, breathing not laboured. On examination found a bullet wound at lower border of fifth rib, under left nipple, and on the back an incision where the bullet was extracted in a line horizontal with its point of entrance, and near the spinal column. He occasionally expectorates a few drops of blood, mixed with mucus, but has not had any hemorrhage of greater amount. The patient was kept perfectly quiet; the heart's action was controlled by the use of appropriate remedies, and his strength supported by nourishing diet. He remained in the same condition until June 14, when, at 1.15 P.M., he spat up about two fluidrachms of blood, and showed symptoms of collapse. In spite of all my efforts he sank rapidly, and died at 2 P.M. The body was removed by the coroner, and I was unable to obtain an autopsy until June 18, nearly four days after death.

Autopsy.—Upon dissecting back the coverings of the ribs, found that the ball had splintered a small piece of the lower edge of the fifth rib. On raising the ribs two and a half pints of blood were removed from the left pleural cavity, and the lung was found floating above the effusion. Owing to partial decomposition having taken place I was unable to find any wound in the lung. The lower portion of the left lung was congested; the upper part was normal. Right lung was healthy. There was no effusion in the pericardium; it was not adherent to the heart, and contained no effusion of lymph. The bullet had penetrated the pericardium anteriorly, passed through the muscular tissue of the wall of the left ventricle, one inch above its apex, and passed out of the pericardium posteriorly. The furrow in the wall of the ventricle was an inch and a half

long, and a quarter of an inch deep, and the edges of the wound were ragged and everted. The muscle appeared to be thickened by inflammatory action; there was no pus, and the appearances were those of an attempt at reparation. The left ventricle held water, and on examination with the finger it could be felt that the ball had not cut entirely through the wall into its cavity. The heart was large, and the aortic valves greatly congested, but normal in shape. The interior of all the cavities of the heart were natural in appearance, and there was no sign of any other lesion of its walls. Owing to the friable state of the left lung, no clear account can be given of its condition. It seems probable that death resulted from hemorrhage from a large bloodvessel in the left lung.

The point of interest in this case is, that the heart and pericardium were extensively wounded by a large pistol bullet, and that the man lived with very little suffering for thirteen days. The condition of the heart at the autopsy seemed to indicate that reparative action had set in, and that death was due to a hemorrhage from an entirely different source.

Case of Fracture of the Third Cervical Vertebra. By H. F. EBERMAN, M.D., of Lancaster, Pa.

A very singular and interesting case of fracture of the third cervical vertebra occurred in Lancaster, Pennsylvania, a few weeks ago.

The patient, William Barracks, aged about seventy years, was making his home in a stable adjoining a hotel, and was in the habit of sleeping in the hay-loft. One morning on arising and while descending the steps, he slipped and fell, striking his occiput violently on the ground, and thus forcibly throwing his head forward on his chest, and rendering him insensible for a considerable time.

After recovering from the shock, he arose and, placing both hands to his neck, walked to the bar-room of the hotel (which is half a square from the place of accident), where he remarked that he thought his neck was hurt, and at the same time called for a glass of whiskey, which he immediately drank. He then returned to the stable, lay down on the hay, and expired in about half an hour.

On the following day, a *post-mortem* examination was made by Dr. H. E. Muhlenberg and myself, with the following result.

The third cervical vertebra was found to be fractured transversely through the body, the arch on the right side was broken entirely through, the articulating surfaces on both sides were fractured through the middle, the transverse process on the right side of the atlas was broken off, and the inter-spinous and posterior vertebral ligaments were ruptured, but the spinal cord remained intact.

The specimen is in the possession of Dr. Muhlenberg.

May 4th, 1879.

OBITUARY NOTICE.

A RECITAL of what Dr. GEORGE B. WOOD has done is a fitting tribute to his memory. We may follow him through his public life, to use the language of woodmen, by the blazes which he has made, almost yearly, along his path, from the obscurity of private life to the brightness of renown. That the career of one who has deservedly attracted and long held the respectful attention of the profession, both at home and abroad, should be noticed in this Journal is unquestionable.

Dr. Wood was born March 13, 1797, in Greenwich, one of the oldest settlements on the river Cohansay, in Cumberland County, New Jersey. His parents belonged to the religious Society of Friends, were well-to-do farmers, and for some time kept a wholesale and retail store of miscellaneous goods. They and their ancestors, at the time of his birth, had owned and occupied the estate on which he was born a half century and upwards. They were always highly respected and influential in the community.

In 1815 Dr. Wood received the degree of Bachelor of Arts from the University of Pennsylvania, became a pupil of Dr. Joseph Parrish, a leading practitioner of the day, and in 1818 acquired the degree of Doctor of Medicine from the same institution. *Dyspepsia* was the subject of his inaugural essay.

When Dr. Wood entered the ranks of the profession, the leading medical minds of Philadelphia and of the country generally had become more than usually interested in measures of improvement. Although the ability and disposition of the professors to teach thoroughly was not doubted, it was believed that the medical teaching of the University, then the only chartered medical school in the city, was defective. The length of the medical session did not afford time enough to enable the professors to deliver complete courses. Lectures on some subjects were omitted every year. As a remedy for such defect, preceptors, in addition to the personal attention which had been usually given to their pupils, employed assistants to impart instruction on special branches; and not long afterwards associations were formed to supplement the teaching of the University, by courses of lectures delivered during the spring and summer. One of these was The Medical Institute of Philadelphia, founded by Dr. Nathaniel Chapman, and another, The Philadelphia Association for Medical Instruction, founded by Dr. Joseph Parrish, both including members of the medical faculty of the University.

In the cities practitioners had ceased almost entirely to supply medicines to their patients. The apothecaries generally were not systematically taught. Very few of them were skilful or scientific pharmacists. No standard of officinal preparations had been established for the common observance of apothecaries of all parts of the country. The strength of preparations was not uniformly the same in different localities, nor even in all shops of the same town. Under such a condition it may be taken for granted that practitioners were reluctant to confide their prescriptions to be dispensed by apothecaries indiscriminately, and that the necessity of establishing a national pharmacopœia was manifest.

It was fortunate for him in the end, perhaps, that when Dr. Wood entered the field, the satisfaction of his personal wants and desires was to be attained and measured by the profits of his own labour. Besides a liberal education, he possessed good health, firmness of purpose, energy, and marked capability of continuous work. It is probable that his first professional aspiration was to become a teacher. He had learned that adequate knowledge and training are essential to success in every vocation, and early acquired a habit of carefully arranging what-

ever he conceived might be necessary to the occasion of his action; nothing was left to chance. He lost no time. It is related that he first lectured on chemistry to young persons of both sexes; and after a short time was employed by his preceptor, Dr. Parrish, to deliver lectures on chemistry to his private pupils. Such was his early training for his brilliant professorial career.

August 1, 1821, Dr. Wood was appointed one of the attending physicians of the Pennsylvania Institution for the Deaf and Dumb. He discharged the duties of the office till Nov. 1844—twenty-three years—and from that time till his decease his name was on the list of the consulting physicians of the Institution.

The Philadelphia College of Pharmacy, with which Dr. Wood's early career is closely associated, owes its origin to a few public spirited and benevolent gentlemen, a majority of them members of the Society of Friends. Its foundation dates from Feb. 23, 1821, when Dr. Gerard Troost was appointed professor of chemistry, and Dr. Samuel Jackson professor of *materia medica*. The purpose of the founders of the college was to increase and diffuse knowledge of pharmacy. So well has it answered expectation, that what was at that time merely a trade, has become a scientific profession which has the confidence and respect of the community. Its members generally are competent and trustworthy, and in this respect are not inferior to physicians as a class. Since its foundation this institution has conferred its degree of graduate in pharmacy on 1528 of its 5913 matriculants. July 23, 1822, Dr. Wood was elected professor of chemistry in place of Dr. Troost, resigned.

About this time his intimacy with Dr. Franklin Bache, who was then teaching chemistry, began. This friendship was confiding and lifelong. Dr. Bache was five years older than his friend; and it is most probable that his experience contributed to the success of enterprises in which they jointly engaged.

April 2, 1823, the young professor married Caroline, the only child of Mr. Peter Hahn. This act severed his rightful connection with the Society of Friends.

Feb. 14, 1824, he delivered, pursuant to appointment, an oration before the Philadelphia Medical Society, in which he said: "Few professions are more truly respectable than that of pharmacy; few require in their members more science, skill, and moral integrity; and, so long as he moves within the proper sphere of his duties, the apothecary may challenge our highest este

Nov. 16, 1824, he delivered an address to the members of the Philadelphia College of Pharmacy, the object of which was to excite attention to its importance, and rouse the zeal of the druggists and pharmacists of the city in its favour. Thirty-five years afterwards he wrote: "It has been among the highest gratifications of my life, that I was able to contribute towards the expansion and permanent success of a school which has been productive of much good, which is still in prosperous operation, and the establishment of which may be considered as the commencement of a new era in the pharmacy of the United States."

Dr. Wood perceived that the influence of scientific and other societies on the lives of their members is often beneficent. His opinion was that "a young man thus connected, if disposed to take advantage of his opportunities, will have much greater chances of distinction and usefulness than if isolated in his course of life."

Feb. 1825, he was elected a member of the Academy of Natural Sciences of Philadelphia; but during his life he never manifested interest in the pursuits of the society. April, 1827, he was elected a fellow of the College of Physicians, of Philadelphia; and Nov. 3, 1845, he was duly elected vice-president in competition with three other candidates, *vice* Dr. Henry Neill, deceased. On the death of Dr. Thomas T. Hewson, he was unanimously elected president of the

society March 7, 1848, and held the office until the close of his life—a period of thirty-one years.

As long as the condition of his health permitted, Dr. Wood actively participated in its proceedings, and performed all his duties in the society most acceptably, and gave liberally towards its progress in various ways. On condition that the library should be open daily, he annually contributed \$500 from June, 1866, and bequeathed \$10,000 to constitute a permanent fund for the perpetuation of this bounty, and directed besides that a mortgage of \$5000, which he held on the building, should be cancelled, and that all the medical books in his library, copies of which were not already in possession of the College, should be given to it.

Oct. 29, 1827, Dr. Wood read before the council of the Historical Society of Pennsylvania, a "History of the University of Pennsylvania," which was printed by the council.

Jan. 17, 1829, he was selected to be a member of the American Philosophical Society, and was elected president, Jan. 1859, and died in office. He bequeathed \$20,000 to the building-fund of the Society; and his "copy of the great work of Canova on the ancient buildings of Rome."

The *Journal of the Philadelphia College of Pharmacy* was started in 1825; four numbers were issued in the course of three years. March 31, 1829, Dr. Wood was appointed a member of the publication committee of the College, and served on it till 1844. The first number of a new series of the journal was issued in April, 1829. Since then it has been published regularly, and now appears monthly.

Jan. 1830, Dr. Wood was a member of the Philadelphia Association for Medical Instruction; he lectured on *materia medica* and the institutes of medicine, and continued till the association was dissolved in 1836.

In Jan. 1830, he was one of the delegates appointed by the College of Physicians of Philadelphia, to the National Convention for the revision of the *Pharmacopœia* of the United States. The convention met in Washington, D. C.. Drs. Wood and Bache were appointed members of the committee of revision and publication.

The first *Pharmacopœia* of the United States was published in Boston in 1820, under authority of a convention composed of representatives of several incorporated medical institutions of the Union, including the College of Physicians of Philadelphia, which met in Washington in January. Dr. Franklin Bache published a review of the organic part of this work in the *American Medical Record* of 1821, vol. iv. p. 483, which is immediately followed in the same volume by an elaborate criticism of the organic part, which is ascribed to Dr. Wood.

Dr. Wood was elected vice-president of the National Convention, and chairman of the committee of revision and publication of the *pharmacopœia*, in 1840; president in 1850 and 1860, and member of the committee of revision and publication in 1870. Dr. Bache was associated with him in every revision of the *pharmacopœia*, except the last.

Sept. 28, 1830, Dr. Wood was elected a trustee of the Philadelphia College of Pharmacy. On his motion a committee was appointed, Oct. 26, 1830, to examine the newly prepared *Pharmacopœia*. It reported, Dec. 28, 1830, that it was in every respect improved, and recommended that the observance of its formulae be enjoined on all members of the college. The work was published in Philadelphia, April, 1831, by John Grigg.

The *North American Medical and Surgical Journal* for Jan. 1831, contains a review ascribed to the pen of Dr. Wood, on "The *Pharmacopœia* of the United States of America, by authority of the General Convention held in 1830. Second edition from the first edition published in 1820, with additions and cor-

rections, New York, Nov. 1830." The reviewer condemns the plan and execution of the work, and shows that the national convention did not authorize or sanction its publication.

May 24, 1831, he was elected professor of *materia medica* in the Philadelphia College of Pharmacy, *vice* Dr. Benjamin Ellis, deceased, and was succeeded in the chair of chemistry by Dr. Franklin Bache.

Jan. 1833, *The Dispensatory of the United States of America* was published. This work was begun in Oct. 1830, in conjunction with Dr. Franklin Bache and Mr. Daniel B. Smith. The latter very soon withdrew. This Dispensatory is mainly an explanatory commentary on the *Pharmacopœia* of the United States. The first edition contains 1073 pages 8vo., and the fourteenth, published 1877, 1879 pages. It is estimated that 120,000 copies of this work have been sold.

Dr. Wood was elected a member of the Board of Trustees of the Girard College, February, 1833, by the City Councils, and served on it till the board was abolished Dec. 23, 1841—eight years. April 1, 1835, he presented a "Report of the Committee on Clothing, Diet, etc., to the Board of Trustees of the Girard College for Orphans;" and July 16, 1840, a "Communication from the Board of Trustees of the Girard College for Orphans to the Select and Common Councils of the City of Philadelphia." This paper is a succinct history of the transactions of the Board from its commencement.

Dr. Wood was always an advocate of temperance. He has recorded his views on "The Temperance Cause" in an essay published in the *United States Review* for January, 1834. He believed that "so long as the advocates of temperance refuse to admit the moderate use of pure fermented liquors, as cider, ale, the light wines, etc., within the meaning of the term, their cause will never be universally nor even generally adopted."

The death of his wife's father, May 10, 1835, placed him in comparatively easy circumstances, and he was soon after enabled to erect a spacious house in which he resided during the remainder of his life.

Oct. 6, 1835, he was elected professor of *materia medica* and pharmacy in the University of Pennsylvania, in place of Dr. John Rodman Coxe. Dr. Wood's lectures on *materia medica* were demonstrative. In addition to the collection of an admirable cabinet of illustrative drawings and specimens, he erected a spacious green-house in connection with a garden in the rear of his dwelling for the preservation and collection of medicinal plants.¹

In 1835 he was elected one of the attending physicians of the Pennsylvania Hospital, and served till 1859—twenty-four years.

In his address to the medical graduates at the commencement, March 26, 1836, he gave a "Sketch of the History of the Medical Department of the University of Pennsylvania."

Jan. 23, 1839, he delivered an address on the "British East India Empire," before The Athenian Institute, an association of gentlemen formed for the purpose of promoting literary tastes and habits in Philadelphia. With this view they set on foot a series of weekly lectures, the subject being left to the choice of the lecturer. During the early years of his career, when he had less professional occupation than he desired, Dr. Wood became so much interested in the affairs of India, especially of Hindostan, that he began to qualify himself to write a history of the country, and employed his leisure in preparing a history of Christianity in India in eleven chapters. At this point his increasing professional avocations induced him to abandon the enterprise; but that so much work might not

¹ See Carson's History of the Medical Department of the University of Pennsylvania, Philada., 1869.

be lost, he published it in 1872, in a volume of Historical and Biographical Memoirs.

In 1847 he published his Treatise on the Practice of Medicine, 2 vols. 8vo. pp. 1848. The sixth edition, pp. 1984, was published in 1867. The aggregate of copies sold up to this time is estimated at 30,000.

In May, 1850, he was elected professor of the theory and practice of medicine and of clinical medicine in the University of Pennsylvania, in place of Dr. Nathaniel Chapman, resigned. During the summer, accompanied by Dr. Joseph Leidy, he visited England, France, Germany, and the northern part of Italy. The fruits of this journey were a large number of drawings of pathological lesions, casts, and models of disease, a quantity of apparatus, and an extensive range of pathological specimens, through the means of which he made his lectures on the practice of medicine eminently demonstrative.¹

June 10, 1851, at the centennial celebration of its foundation he read his "History of the Pennsylvania Hospital."

In the company of Dr. Franklin Bache he passed the summer of 1853 in Europe.

May 6, 1856, at Detroit, he delivered an address to the American Medical Association of which he had been elected president at the preceding meeting. He was a member of the association from its formation, 1847, and always manifested zealous interest in its great objects, improvement of medical education, increase of the qualification of the members of the profession, and the advancement of medical science.

Oct. 1, 1856, he read his "Historical Sketch of the department of Pennsylvania Hospital for the Insane," at the laying of the corner stone of the new building.

In 1856 he published his Treatise on Therapeutics and Pharmacology, two volumes, pp. 1741. 8vo. The third edition, pp. 1848, was issued in 1868. The number of copies sold up to this time is estimated at 10,000.

December, 1859, he published "Introductory Lectures and Addresses on Medical Subjects delivered chiefly before the Medical Classes of the University of Pennsylvania." 8vo. pp. 460.

Having completed the sixty-third year of his life, Dr. Wood determined to relinquish his practice of medicine, which was never very large, and retire. In 1860 he resigned his professorship, and was elected Emeritus Professor of the Theory and Practice of Medicine in the University of Pennsylvania, a position for which a retired pay should be provided for life instead of being merely complimentary. He had been a professor in the University twenty-five years.

May 6, 1860, a complimentary dinner was given to Dr. George B. Wood, at the Academy of Music, "by a large number of his professional friends, in testimony of their respect and esteem for him personally, and of their estimate of the value of his labours to elevate the character of the profession and to extend the bounds of our science. Certainly, no one in this country has better earned this compliment from his professional brethren."²

Dr. Wood went to Europe in the summer of 1860 and returned in 1862. In 1863 he was chosen a trustee of the University of Pennsylvania.

At the instigation of Dr. Wood the board of trustees created, April 4, 1865, in connection with the Medical Department of the University, the Auxiliary Faculty of Medicine. The professors receive a salary. It consists of professors of: 1, zoology and comparative anatomy; 2, botany; 3, mineralogy; 4, hygiene; 5, medical jurisprudence and toxicology. Each course consists of at least thirty-

¹ See Carson's History of the Medical Department of the University of Pennsylvania.

² The Medical News and Library, June, 1860.

four lectures delivered in April, May, and June. The first courses were delivered in 1866, and are continued.

Dr. Wood paid each professor \$500 annually from the commencement, and bequeathed a fund of \$50,000 from which the payment is to be continued. He also bequeathed to the University his numerous collections, all his medicinal plants, and \$5000 to establish a botanical garden and conservatory, and to the University Hospital \$75,000 to establish in it "the Peter Hahn Ward."

March 4, 1867, Mrs. Wood died. The marriage was without issue.

April, 1872, he published his "Historical and Biographical Memoirs, Essays, Addresses, etc. etc., written at various times during the last fifty years, and now first published in a collected form," 8vo. pp. 576.

The aggregate of Dr. Wood's published writings exceeds 7000 pages 8vo., and, it is understood, he has left some manuscripts unprinted. He has achieved nothing in the fields of original research and invention.

He was an uncommonly skilful teacher, an effective writer, and successful author. Most of his study and writing were done during the night, between the hours of 10 P. M. and 4 A. M. He gathered reward as he worked without reckoning the prospective profit of his toil. He wrought incessantly. Even his annual summer journeys to different parts of the United States, or in Europe, seemingly for relaxation alone, always had some object of professional interest to be attained. Those summer jaunts were always made in a somewhat ostentatious style, so that he never appeared to strangers as a commonplace traveller. Though he frequently at home entertained tastefully and sumptuously numerous evening guests, social intercourse in the ordinary sense was not necessary to his happiness. His great pleasure was found in the solitude of his study. He was methodical in his way, painstaking and accurate in his work, and always punctual to the minute of appointment. He seemed to think that society generally is not aware of the incalculable benefits which are derived from the medical profession, independently of the services that the sick and wounded receive from it; that, in the estimation of the unthinking, medical attendance is necessarily personal service, and therefore a sort of servile occupation; and for this reason that the value of the profession is not appreciated as it should be. To make its dignity conspicuous, and place it higher in public estimation, was a lifelong purpose, to be achieved, in his opinion, by augmenting the facilities of the education and increasing the qualifications of its members. This disposition is manifest in his beneficence to the College of Physicians and to the University of Pennsylvania, as well as in his laborious contributions to the progress of the Philadelphia College of Pharmacy, and to giving stability and due authority to the *Pharmacopœia*, which is ascribable largely to his labours.

Dr. George B. Wood died at his residence in Philadelphia, March 30, 1879, at the advanced age of 82 years, having spent his long life usefully and acceptably in every respect. He was generous, benevolent, charitable in the broadest sense of the term. His character is without stain.

W. S. W. R.

INDEX.

A.

Abdomen, malignant tumour of, resembling extra-uterine pregnancy, 153
Adenoma of mamma, true, 459
Albuminuria, physiological, 240
Alimentation, defibrinated blood for rectal, 242
American Gynecological Society's Transactions, notice of, 512
— Health Primers, notice of, 537
Amory, haematinic properties of dialyzed iron, 246
Amyl, nitrite of, 547
Anæmic bruit of cardiac base, 565
Anderson, iodide of starch in lupus erythematoses, 570
Andrews, hypodermic injection of carbolic acid in hemorrhoids, 268
Aneurism of aorta, ligation of carotid and subelavian for, 269
— electrolysis in, 272
Antiseptics on battle-field, 571
Aortitis with neuritis of cardiac plexus, 254
Athill, Diseases of Women, notice of, 540
Atlee, malignant tumour of abdomen resembling extra-uterine pregnancy, 153

B.

Badger, rupture of pregnant uterus, 468
Ball, hysterical hemianæsthesia in a man, 557
Barlow, Regressive Paralysis, notice of, 534
Barnes, forceps in lingering labour, 278
— Manual of Midwifery, notice of, 537
Barwell, hip joint disease, 580
— ligation of carotid and subclavian for aortic aneurism, 269
Beach, giant birth, 279
Behrend, Skin Diseases, notice of, 535
Bellamy, invagination of small intestine in rectum, 264
Benzoate of sodium as an antipyretic and antiseptic, 245
Berenger-Feraud, pelletière, 545
Bibliographical Notices—
— American Gynecological Society's Transactions, 512
— Health Primers, 537
— Athill, Diseases of Women, 540
— Barlow, Progressive Paralysis, 534
— Barnes, Manual of Midwifery, 537
— Behrend, Skin Diseases, 535

Bibliographical Notices—

— Board of Health Reports, 520
— Bucknill and Tuke, Psychological Medicine, 533
— — Habitual Drunkards, 227
— Cohen, Diseases of the Throat, 530
— Cohn, School Hygiene, 229
— Curtis, Pathogeny of Diphtheria, 230
— Cyr, Diabetes, 542
— Dowse, Syphilis of the Brain and Cord, 510
— Duhring, Atlas of Skin Diseases, 236
— Duncan, Female Perineum, 206
— Ellis, Demonstrations of Anatomy, 223
— Farquharson, Therapeutics, 235
— Fox, Skin Disease, 224
— Galabin, Diseases of Women, 543
— Guy's Hospital Reports, 497
— Habershon, Diseases of Abdomen, 226
— — Diseases of Stomach, 541
— Higgins, Ophthalmic Out-Patient Practice, 225
— Hygiene of Sight, 220
— Jeffries, Colour Blindness, 511
— Liveing, Skin Disease, 224
— McSherry, Health and How to Promote It, 208
— National Dispensatory, 197
— Neubauer and Vogel, Analysis of Urine, 238
— Pavly, Diabetes, 199
— Pollock, Notes on Rheumatism, 232
— Porro's Method of Cæsarean Section, 507
— Seiler, Diseases of Throat and Nasal Cavities, 219
— Shaffer, Pott's Disease, 539
— Skene, Diseases of Bladder and Urethra, 524
— Skin Disease, Recent Works on, 224
— Smith, Diseases of Children, 233
— State Medical Societies Transactions, 528
— Thomas, Diseases of Women, 233
— Thompson, Diseases of Urinary Organs, 517
— Pulmonary Hemorrhage, 514

Bibliographical Notices—

- Transactions of Obstetrical Society of London, 217
 Whistler, Syphilis of Larynx, 503
 Wilson, Lectures on Dermatology, 204
 Woakes, Deafness, Giddiness, and Noises in the Head, 210
 Wood, Therapeutics, 234
 Wyeth, Essays in Surgical Anatomy and Surgery, 235
 Ziemssen's Cyclopædia, 213
- Bile, colorimetric method for quantitative determination of, 120
 Bladder, villous disease of, 579
 Blepharospasmus, clonic, 434
 Blindness, tobacco, 277
 Bones, disturbance in growth of long, after neurosis of diaphysis, 581
 , sarcoma of long, 17
 Boone, gunshot wound of heart, 589
 Bosworth, laryngeal phthisis, 253
 Bourneville et Regnaud, Photographs from La Salpêtrière, review of, 173
 Brain, duplication of functions of, 543
 , gunshot wound of, 146
 Bright's disease, chronic, 257
 Bryant, cholecystotomy, 263
 , laparotomy, 267
 Bucknill and Tuke, Psychological Medicine, notice of, 533
 , Habitual Drunkards, notice of, 237
 Bucquoy, electrolysis in aneurism of aorta, 272
 Bull, lardaceous infiltration of retina, 445
- C.
- Calculus, biliary, removal of, from gall bladder, 263
 California Medical Society's Transactions, notice of, 530
 Carbolic spray in catarrhal affections, 252
 acid poisoning, sulphate of soda in, 280
 Catgut as a source of infection, 573
 Cerebral localization, review on, 182
 Cerebro-spinal meningitis, epidemic of, 555
 Charcot, laryngeal crisis, 252
 , Localization in Diseases of the Brain, review of, 182
 Chloroform, effects of, on blood pressure, 244, 545
 Cholecystotomy, 263
 Chorditis vocalis inferior hypertrophica, 251
 Chorea, a functional disorder, 557
 , use of Fowler's solution in, 559
 , salicylate of soda in, 560
 Cod liver oil, etherized, 243
 Cohen, Diseases of the Throat, notice of, 530
 Cohn, School Hygiene at Paris Exhibition, notice of, 220
 Colour-blindness, Jeffries on, 511
 Coprostasis, chronic, 256
 Coracoid process, fracture of, 583
 Cranial bones, contusions of, 398
 Croton chloral, therapeutic value of, 242
 Croup and diphtheria, 248

- Cuffer, aortitis with neuritis of cardiac plexus, 254
 Curtis, Pathogeny of Diphtheria, notice of, 230
 Cyr, Diabetes, notice of, 542
 Cystitis of neck of bladder, 268
 Cysts, abdominal, diagnostic puncture of, 280
 Czerny, antiseptic laparotomy, 265

D.

- Dabney, topical uses of ergot, 101
 Davis, minute anatomy of liver, 128
 Deafness of syphilis, sudden, 57
 Depaul, rickets, 279
 Diabetes complicated with gangrene, prognosis in, 255
 Dickinson, diphtheria and croup, 248
 Diphtheria and croup, 248
 , chloral in, 251
 , pathogeny of, 230
 Dispensatory, National, notice of, 196
 Dowse, Syphilis of Brain and Cord, notice of, 510
 Drainage, sanitary, 135
 Drouot, diuretic action of squill, 243
 Duhring, Atlas of Skin Diseases, notice of, 236
 , inflammatory fungoid neoplasm, 570
 Duncan, Female Perineum, notice of, 206
 Dyspnœa, quebracho in, 547

E.

- Ear, reflex action in, 584
 Eberman, fracture of cervical vertebra, 590
 Ebstein, heart sounds heard at a distance, 566
 Elbow, resection of, for ankylosis, 273
 Eldridge, hernia of trachea, 70
 Eliot, palato-pharyngeal tumour, 124
 Ellis, Demonstrations of Anatomy, notice of, 223
 Emmet, Gynaecology, review of, 157
 Ergot, topical uses of, 101
 Erlenmeyer, undescribed cause of reflex vertigo, 557
 Esmarch, antiseptics on battle-field, 571
 Estlander, antiseptic treatment of head injuries, 262
 Ether, effects of, on blood pressure, 244, 545
 Ethidene, effects of, on blood pressure, 244, 545
 Eucalyptus oil, inhalation of, 548

F.

- Farquharson, Therapeutics, notice of, 235
 Ferrier, Localization of Cerebral Disease, review of, 182
 Fleck, chronic coprostasis, 256
 Fetus, viability of, after death of mother, 389
 Forceps, use of, in lingering labour, 278
 Fox, Epitome of Skin Disease, notice of, 224
 Frey, epidemic cerebro-spinal meningitis, 555
 Fungoid neoplasm, inflammatory, 570

- G.**
- Galabin, Diseases of Women, notice of, 542
 Galezowski, ophthalmic migraine, 583
 Gall stones, intestinal obstruction from, 267
 ——, removal of, from gall bladder, 263
 Garson, inequality in length of lower limbs, 543
 Gaspey, nitrite of amyl, 547
 Gastric phenomena, peculiar auscultatory and percussory, 569
 Giant birth, 279
 Gibney, dislocation of hip in children, 453
 Goelet, warm water in surgery, 113
 Goodell, antiseptic ovariotomy, 377
 ——, Lessons in Gynecology, review of, 480
 Gould, amputation at hip-joint, 273
 Gross, obituary notice of Dr. Isaac Hays, 281
 ——, sarcoma of long bones, 17, 338
 ——, true adenoma of mamma, 459
 Guy's Hospital Reports, notice of, 497
- H.**
- Habershon, Diseases of Abdomen, notice of, 226
 ——, Diseases of Stomach, notice of, 541
 Hagen, estimation of sugar in urine, 241
 Hair, rare nose condition of, 571
 Harris, viability of fetus after death of its mother, 389
 Harvey, gunshot wound of brain, 146
 Havem, action of iron in chloro-anæmia, 549
 Hays, Dr. Isaac, obituary notice of, 281
 Head, injuries of, antiseptic treatment in, 262
 Heart, gunshot wound of, 589
 ——, rupture of, traumatic, 566
 —— sounds heard at a distance, 566
 Hedysarum gangeticum in dysentery, 256
 Helferich, disturbance in growth of long bones after necrosis of diaphysis, 581
 Hemianesthesia, hysterical, in a man, 556
 Hemorrhage, Pulmonary, Thompson on, notice of, 514
 Hemorrhoids, hypodermic injection of carbolic acid in, 268
 Henoch, tubercular meningitis in childhood, 556
 Herman, treatment of fibroids of uterus, 586
 Hernia of trachea, 70
 Higgins, Ophthalmic Out-Patient Practice, notice of, 225
 Hip, dislocation of, in children, 453
 Hip-joint, amputation of, 272
 —— disease, etiology of, 580
 Hirschfelder, colorimetric method for quantitative determination of bile, 120
 Huchard, mucous concretions in intestine, 255
 Hudson, villous disease of bladder, 579
 Hulke, sutural junction of divided ulnar nerve, 276
 Huse, fracture of coracoid process, 583
 Huseman, antidotes for strychnia, 587
 Hotz, clonic blepharospasmus, 434
 ——, intra-ocular lesions produced by sun-stroke, 105
- I.**
- Ileum, torsion of, 78
 Intestinal obstruction from invagination of small intestine in walls of rectum, 264
 —— gall stones, 267
 Intestine, double perforation of, 267
 Iron, dialyzed, haematinic properties of, 246
 ——, mode of action of, in chloro-anæmia, 549
- J.**
- Jaccoud, multilocular pleurisy, 561
 Jeffries, Colour-Blindness, notice of, 511
- K.**
- Kaufmann, cancer of thyroid, 573
 Kentucky Medical Society's Transactions, notice of, 529
 Kidney, extirpation of, 263, 575
 King, old neuralgia cured by operation, 156
 Koch, absence of spleen, 239
- L.**
- Laforest, cystitis of neck of bladder, 268
 Langenbeck, oophorectomy in congenital vaginal defect, 586
 Laparotomy, 267
 ——, antiseptic, 265
 Laryngeal crisis, 252
 —— phthisis, 252, 560
 Larynx, syphilis of, 503
 Lea, sanitary drainage, 135
 Lehnebach, benzoate of soda in puerperal fever, 585
 Lesser, perforation of œsophagus, 568
 Lidell, contusion of cranial bones, 393
 Liebreich, School Life in its Influence on Sight and Figure, notice of, 220
 Limbs, inequality in length of lower, 543
 Lithotrity at a single sitting, 578
 Little, occlusion of vena cava, 568
 Liveing, Skin Disease, notice of, 294
 Liver, minute anatomy of, 128
 Lucas-Championnière, trephining guided by cerebral localization, review of, 489
 Lungs, calcification of, 253
 ——, duplication of functions of brain, 543
 Lupus erythematoses, iodide of starch in, 570
- M.**
- Mackenzie, laryngeal phthisis, 560
 MacLagan, salicylic acid, in rheumatism, 550
 Malomed, chronic Bright's disease, 257
 Mamma, true adenoma of, 459
 Marcacci, physiological albuminuria, 240
 Marti, pilocarpine in uterine contractions, 584
 Martin, tobacco blindness, 277

- Martinet, salivary tumour following the extirpation of parotid tumour, 262
 Massachusetts State Board of Health Report, notice of, 520
 McSherry, Health and How to Promote It, notice of, 208
 Meningitis, tubercular, in childhood, 556
 Menthol, a new antiseptic, 544
 Mercier, typhoid fever and periostitis, 261
 Michael, tinnitus aurium treated by nitrite of amył, 277
 Michigan Board of Health Report, notice of, 532
 Migraine, ophthalmic, 583
 Monod, lymphadenoma of testis, 579
 Moritz, carbolic spray in catarrhal affections, 252
 Mosler, inhalation of eucalyptus oil, 548
 Mucous concretions of intestines, 255
 Mumps, 553
- N.
- Neubauer and Vogel, Analysis of Urine, notice of, 238
 Neuralgia, old, cured by operation, 156
 ———, subcutaneous injection of ergot in, 560
 Nicotine, physiological action of, 247
 Nikitin, sclerotic acid, 246
- O.
- Obstetrical Society of London, Transactions of, notice of, 217
 Oesophagus, perforation of, 568
 Ohio Medical Society's Transactions, notice of, 528
 Ollier, resection of elbow for ankylosis, 273
 Oöphorectomy in congenital vaginal defect, 586
 Osler, obliteration of inferior vena cava, 239
 Osteomyelitis, reproduction of tibia after, 582
 Ott, paths of conduction in spinal cord, 438
 Ovarian cysts, drainage of adherent, 88
 Ovariotomy, antiseptic, 377
 ———, normal, double, 280
 ———, treatment of pedicle in, 586
- P.
- Packard, intra-orbital sarcoma, removal of, 126
 Palato-pharyngeal tumour, 124
 Paul, anæmie bruit of cardiae base, 565
 Pavay, Diabetes, notice of, 199
 Péan, excision of pylorus, 575
 Pelletière as an anthelmintic, 545
 Penzoldt, quebracho in dyspnoea, 547
 Periostitis and typhoid fever, 261
 Perroud, Fowler's solution in chorea, 559
 Pertussis, treatment of, by inhalation, 386
 Peterson, puerperal fever treated by benzoate of soda, 279
 Peyrot, diabetes complicated with gangrene, 255
 Phthisis, high altitude in treatment of, 564
 ———, laryngeal, 252, 560
 Pilocarpine, action of, on uterine contractions, 584
 Pinet, mumps, 553
 Pleurisy, multilocular, 561
 Pollock, Notes on Rheumatism, notice of, 232
 Porro's method of Cæsarean section, 506
 Pregnancy, extra-uterine, malignant tumour of abdomen resembling, 153
 Prentiss, hysterical tetanus, 451
 Prostate, hypertrophy of, operation for relief of, 577
 Public Health Legislation, National, review of, 471
 Puerperal fever treated by benzoate of soda, 279, 585
 Pyæmia, report to Pathological Society of London on, 260
 Pylorus, excision of, 575
- Q.
- Quebracho, a palliative remedy in dyspnoea, 547
- R.
- Rectal alimentation, defibrinated blood for, 242
 Rectum, phantom stricture of, 317
 Renal cyst mistaken for ovarian, 263
 Rendu, Cerebral Localization, review of, 182
 René, nicotine, 247
 Retina, lardaceous infiltration of, 445
 Reviews—
 Bourneville et Regnard, Photographs from La Salpêtrière, 173
 Cerebral Localization, 182
 Emmet's Gynaecology, 157
 Goodell, Lessons in Gynecology, 480
 Lucas-Championnière, Trehphining Guided by Cerebral Localization, 489
 National Public Health Legislation, 471
 Rheumatism, influence of treatment on course of, 551
 ———, salicylic acid in, 550
 Rickets, 279
 Riddell, croton chloral, 242
 Riedinger, double perforation of intestine, 267
 Rivine, treatment of strychnia poisoning, 588
 Rokitansky, chloral in diphtheria, 251
- S.
- Sabourin, paralysis of ulnar nerve, 257
 Salivary tumour following extirpation of tumour of parotid gland, 262
 Sarcoma, intra-orbital, 126
 ——— of long bones, 17, 338
 School hygiene, 220
 Schroetter, chorditis vocalis inferior hypertrophica, 251
 Sclerotic acid, physiological action of, 246
 Seiler, Diseases of Throat and Nasal Cavities, notice of, 219
 Sexton, sudden deafness of syphilis, 57
 Shaffer, Pott's Disease, notice of, 539
 Shoulder, deformity of, following nerve injury, 85
 Simpson, double oöphorectomy, 280

- Skene, Diseases of Bladder and Urethra, notice of, 524
 Smith, defibrinated blood for rectal alimentation, 242
 —, Diseases of Children, notice of, 233
 —, paths of conduction in spinal cord, 438
 —, rare nodose condition of hair, 571
 —, treatment of pertussis by inhalation, 386
 Smyth, extirpation of kidney, 575
 Spiegelberg, diagnostic puncture of serous cysts, 280
 —, laceration of cervix uteri, 585
 —, treatment of pedicle, 586
 Spinal cord, paths of conduction of sensory and motor impulses in cervical, 438
 Spleen, total absence of, 239
 Squill, diuretic action of, 243
 Squire, influence of treatment on course of rheumatism, 551
 Stimson, abdominal drainage of adherent ovarian cysts, 88
 Stricture of rectum, phantom, 317
 Strychnia, antidotes for, 587
 —, poisoning, treatment of, 588
 Sturge, rare vaso-motor disturbance in leg, 258
 Sturges, chorea a functional disorder, 557
 Sugar in urine, estimation of, 241
 Sunstroke, intra-ocular lesions produced by, 105
 Syphilis, sudden deafness of, 57
- T.
- Tennessee Medical Society's Transactions, notice of, 528
 Terillon, traumatic ruptures of heart, 566
 Testis, lymphadenoma of, 579
 Tetanus, hysterical, 451
 Thomas, Diseases of Women, notice of, 233
 Thompson, Diseases of Urinary Organs, notice of, 517
 —, lithotrity at a single sitting, 578
 —, operation for hypertrophied prostate, 577
 —, Pulmonary Hemorrhage, notice of, 514
- Thyroid, cancer of, 573
 Tiffany, deformity of shoulder following nerve injury, 85
 Tinnitus aurium treated by nitrite of amy, 277
 Tobacco blindness, 277
 Trachea, hernia of, 70
 Trephining guided by cerebral localization, 489
 Typhoid fever and periostitis, 261
- U.
- Ulnar nerve, paralysis of, 257
 —, sutural junction of divided, 276
 Uterus, cervix of, laceration of, 585
 —, fibroids of, treatment of, 586
 —, rupture of pregnant, 468
- V.
- Van Buren, phantom stricture, 317
 Vaso-motor disturbance in leg, rare, 258
 Vena cava inferior, obliteration of, 239, 568
 Vertebra, fracture of cervical, 590
 Vertigo, reflex, undescribed cause of, 557
- W.
- Water, warm, in surgery, 113
 Weil, reflex action in ear, 584
 Weinlechner, reproduction of tibia after osteo myelitis, 582
 Whistler, Syphilis of the Larynx, notice of, 503
 Williams, high altitudes in phthisis, 564
 Wilson, Lectures on Dermatology, 204
 —, torsion of ileum, 78
 Woakes, Deafness, Giddiness and Noises in the Head, notice of, 210
 Wood, Dr. George B., obituary notice of, 591
 —, Therapeutics, notice of, 234
 Wyeth, Essays in Surgical Anatomy and Surgery, notice of, 235
- Z.
- Ziemssen's Cyclopaedia, notice of, 43
 Zweifel, catgut as a source of infection, 573

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